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# **Science & Technology**

***Japan***

STA ANALYSIS OF TRENDS IN  
INTRODUCTION OF FOREIGN TECHNOLOGY

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## SCIENCE & TECHNOLOGY JAPAN

### STA ANALYSIS OF TRENDS IN INTRODUCTION OF FOREIGN TECHNOLOGY

92FE0419A Tokyo STA REPORT in Japanese Dec 91 pp 1-90

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## **STA Analysis of Trends in Imported Foreign Technologies**

92FE0419A Tokyo STA REPORT in Japanese Dec 91 pp 1-90

[Report prepared by the Information System Division, National Institute of Science and Technology Policy of the Science and Technology Agency]

### **[Text] Introduction**

This survey data are presented with the goal of contributing to the understanding of Japan's science and technology activities by highlighting the current situation in importing foreign technologies into Japan. We have summarized the actual foreign technologies imported to Japan during FY90 and analyzed recent trends.

Our statistics and analysis of imported foreign technologies are based on notifications and other documents concerning signed (or modified) contracts for importing technology in compliance with the Law for Managing Foreign Exchange and Trade (as amended in December 1979).

### **Synopsis**

The total number of signed contracts for importing new technologies in FY90 was 3,211, an increase of 11 percent compared to that in FY89. This is the first time an increase of more than 10 percent was recorded since 1987. Among the imported technologies—according to the technology classification (medium-level classification)—electric machinery and devices covered 1,722 contracts, or 61 percent of the total and an increase of 23 percent from FY89, indicating substantial continuing increases. This category was followed by general machinery and devices, chemical products, clothing and textile products, and other products. Each of these categories, except for the general machinery and devices, showed a decrease from FY89. When we examined the data in more detail—according to the technology classification (detailed classification)—computers accounted for 1,588 contracts, or 50 percent of the total (an increase of 25 percent from FY89), indicating that imported technology was dominated by computers. This leading category was followed by electronic communications parts, outer garments, medical supplies, and radio, television and audio equipment.



Technology exporting countries were led by the United States, which provided 66 percent of the total transactions, a significant increase of 17 percent from FY89. The United States was followed by Germany, the United Kingdom, France and Switzerland. It is noteworthy that the import from Switzerland has increased by 31 percent from FY89. In terms of the technology classification (medium-level classification), contracts on electric machinery and devices from the United States topped the list, reaching 48 percent of the total or an increase of 27 percent from FY89. This category was followed by general machinery and devices and chemical products from the United States.

The countries that exported computers were again led by the United States, which accounted for 80 percent of imported technologies in this category, an increase of 29 percent from FY89. The United States was followed by the United Kingdom, Canada and Singapore. Canada suddenly has increased its export by 80 percent from FY89.

When we analyze imported technologies according to advanced technology areas, software accounted for 1,519 transactions, or 47 percent of the total and an increase of 25 percent from FY89, indicating that software dominates imported technologies. This is followed by semiconductors and hardware.

In technology trade balance, the total payment for imported technologies has increased 10 percent from FY89, and the total amount received from technologies exported [by Japan] has also increased by 18 percent from that of FY89, thus resulting in the technology trade balance ratio (amount received/amount paid) of 0.43, an improvement of 7 percent over FY89.

Imported technology types were know-how (78 percent of the total), patents (24 percent) and trademarks (16 percent); know-how increased most, by 13 percent [from FY89].

According to the conditions for the payment of compensation, "other fees" category (other than percentage deal, such as unit price deal per item) dominated at 51 percent of the running royalty deals (an increase of 22 percent from FY89). The category of percentage comparison [of fees] to FY89 was dominated by items that "changed by less than 2 percent," accounting for an increase of 29 percent. "Other fees" arrangements in electric machinery and devices accounted for 78 percent, an increase of 32 percent from FY89.

On contract periods, "Other" periods (such as no definite period) accounted for 41 percent of the total transactions (an increase of 25 percent from FY89). In particular, 55 percent of the deals in electric machinery and devices stipulated "other" contract periods.

Sixty-one percent of the imported technologies was limited to "Japan only," (export [from Japan] forbidden). However, in terms of percentage changes from FY89, deals that allowed export to "the entire world" and to "Korea and Taiwan" have increased by 21 percent each.

Contracts that permitted resale of patent licenses accounted for 32 percent of the total, representing an increase of 25 percent from the last fiscal year.

Businesses with capital funds exceeding ¥50 billion that imported technologies occupied 32 percent of the total, an increase of 25 percent from FY89. The highest growth rate of 36 percent, however, was experienced by companies whose capital stocks were "more than ¥50 million but less than ¥100 million."

## Part I. Analysis of Trends in Imported Foreign Technologies

### 1.1 Number of Imported Technology Contracts and Others

• The total number of new contracts for imported technology was 3,211, an increase of 11 percent compared to that for FY89 and 1.5 times greater than the number imported 10 years ago.

The total number of new contracts for imported technology (A) signed during FY90 was 3,211, an increase of 313 contracts (10.8 percent). This total exceeded 3,000 for the first time, setting a record.

The trend in new contracts signed each year for imported technology during the past 10 years (Table 1) shows that the number decreased in FY 1986 as a result of a recession, but it rebounded in FY 1987 with an increase of 14.7 percent. This increasing trend has continued since then. In FY90, the rate of increase exceeded 10 percent after two years [of lower rates], resulting in the number of imported technologies being 1.3 times that of 5 years ago, and 1.5 times that of 10 years ago.

Table 1. Trends in Imported Technology Contracts

FY	No. of imported technology contracts (A)	Comparison to preced- ing FY	Extension of exist- ing con- tracts in essence (B)	Contracts with addi- tional technology (C)	Contracts with new imported technology in essence (A-B+C)
80	2142	1.2	222	173	2093
81	2076	-3.1	251	188	2013
82	2229	7.4	134	207	2302
83	2212	-0.8	56	214	2370
84	2378	7.5	144	177	2411
85	2436	2.4	135	225	2526
86	2361	-3.1	112	218	2467
87	2709	14.7	126	224	2807
88	2834	4.6	84	263	3013
89	2898	2.3	50	235	3083
90	3211	10.8	74	324	3461

Among the new contracts, 407 contracts were for "trademark only" (an increase of 8.0 percent from FY89). The remaining 2,804 contracts represent an increase of 283 contracts (11.2 percent) from that during FY89.

Of the new contracts, 74 contracts (an increase of 24 contracts from that in FY89) actually repeated the same commitments as the previous contracts when the latter has expired (B: Contract extension in essence).

• There were 324 modified contracts that added technologies to be imported, representing an increase of 38 percent from that in FY89.

The total number of modified contracts was 1,283, an increase of 97 contracts (8.2 percent) from that in FY89. Among them, 324 contracts were modified to add technologies to be imported (C: New contracts in essence), an increase of 89 contracts (37.9 percent) from that in FY89 and the highest record so far. Contracts accompanied by addition of technologies accounted for 25.3 percent (19.8 percent in FY89) of all modified contracts.

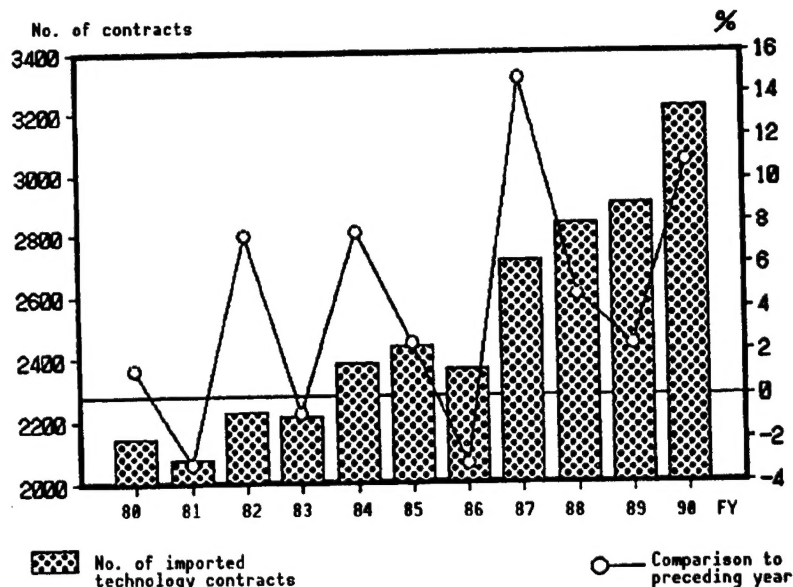


Figure 1. Trends in Number of Imported Technology Contracts

Table 1-2. Summary of Technologies Imported in FY90

New contracts	Total A		3,211
	Appointed technology	Total	1,957
		Compensation exceeded ¥100 million	856
	Extended contracts in essence		74
Modified contracts	Total		1,283
	Appointed technology	Total	612
		Compensation exceeded ¥100 million	187
	Modified contracts with additional technology		324
	Succession of status		293
Contracts importing new technology in essence			3,461

As a result, the total number of contracts that imported new technologies in essence (A - B + C defined above) was 3,461, an increase of 378 contracts (12.3 percent) from that in FY89.

- The number of contracts on appointed [targeted] technology was 1957, an increase of 22 percent from that in FY89. This number accounts for 61 percent of the total number of new contracts.

Among the new contracts, 1957 contracts involved appointed technology, an increase of 347 contracts (21.6 percent) from that in FY89. The appointed technology contracts accounted for 60.9 percent (55.6 percent in FY89) of all [new] contracts. Among them, 856 contracts (an increase of 135 contracts, or 18.7 percent from that in FY89) exceeded ¥100 million in compensation.

## 1.2 Imported Technologies According to Technology Classification

- "Manufacturing industry" accounted for 98.7 percent of the total

When the technical content of technology import contracts signed during FY90 was analyzed according to the technology classification (general classification), 3,169 contracts (an increase of 11.3 percent from that in FY89) were in the "manufacturing industry," accounting for 98.7 percent of the total. This was followed by 18 contracts for the "construction industry" (a decrease of 3 contracts from that in FY89), 18 contracts for "other industries" (a decrease of 3 contracts from that in FY89), 5 contracts for "agricultural, forestry and fishing industries" (a decrease of 1 contract from that in FY89) and 1 contract for the "mining industry" (a decrease of 1 contract from that in FY89).

- Contracts on "electric machinery and devices" have increased by 23 percent, accounting for 61 percent of the total.

When the contents of the contracts for the manufacturing industry was analyzed (Table 2) according to the technology classification (medium-level classification), 1972 contracts dealt with "electric machinery and devices," accounting for 61.4 percent of the total number of contracts. Other categories with more than 100 contracts were: 295 contracts for "general machinery and devices" (9.2 percent of the total), 207 contracts for "chemical products" (6.4 percent of the total), 159 contracts for "clothing and textile products" (5.0 percent of the total) and 129 contracts for "other products" (4.0 percent of the total). These top 5 categories accounted for 86 percent of the total.

The percentage comparison of these top 5 categories to the number of contracts signed in FY89 indicated that "electric machinery and devices" increased most at 22.9 percent, while "general machinery and devices" was the second with an increase of 4.2 percent. On the other hand, "clothing and textile products" have decreased by 12.6 percent, "chemical products" have decreased by 13.8 percent and "other products" also have decreased by 3.7 percent; only the top 2 categories increased.

Table 2. Trends in Imported Technology According to Technology Classification (Medium-level classification)

Technology classification (medium-level classification) [Industry]	FY81	FY85	FY90	Comparison to preceding year	Proportion
All industries	2076	2436	3211	10.8	100
Agricultural, forestry and fishing	2	7	5	-16.7	0.2
Mining	1	5	1	-50.0	0.0
Construction	18	20	18	-14.3	0.6
Manufacturing	2030	2388	3169	11.3	98.7
Food and tobacco	37	46	32	-25.6	1.0
Fibers	42	59	32	39.1	1.0
Clothing, textile	282	203	159	-12.6	5.0
Lumber, wood, furniture, etc.	25	20	13	30.0	0.4
Pulp and paper products, printing	18	29	10	25.0	0.3
Chemical products	223	246	207	-9.2	6.4
Petroleum and coal products	5	12	11	-8.3	0.3
Rubber products	17	6	9	28.6	0.3
Tanned skin, leather products, furs	63	67	48	0	1.5
Ceramics	43	51	36	-5.3	1.1
Iron and steel	11	19	7	-30.0	0.2
Nonferrous metals	17	10	19	90.0	0.6
Metal products	49	56	44	10.0	1.4
General machinery and devices	450	355	295	4.2	9.2
Transportation machinery	78	113	80	-23.8	2.5
Precision machinery	72	62	66	4.8	2.1
Electric machinery and devices	448	900	1972	22.9	61.4
Other products	150	134	129	-3.7	4.0
Other industries	25	16	18	-14.3	0.6

When imported technologies are compared with those imported in FY81 (9 years ago) and FY85 (5 years ago), "electric machinery and devices" has increased noticeably, 4.4 times that for FY81 and 2.2 times that for FY85. No other categories in the top five has increased. "Clothing and textile products" have decreased most, 0.56 times that for FY81 and 0.78 times that for FY85. Other categories also decreased: "general machinery and devices" became 0.66 times that for FY81 and 0.83 times that for FY85; "other products" became 0.86 times

that for FY81 and 0.96 times that for FY85; "chemical products" became 0.93 times that for FY81 and 0.84 times that for FY85, thus indicating that technology import was concentrated in "electric machinery and devices."

• Contracts for "computers" have increased by 25.2 percent, accounting for about 50 percent of the total number of contracts and more than 7 times the number of contracts signed 9 years ago.

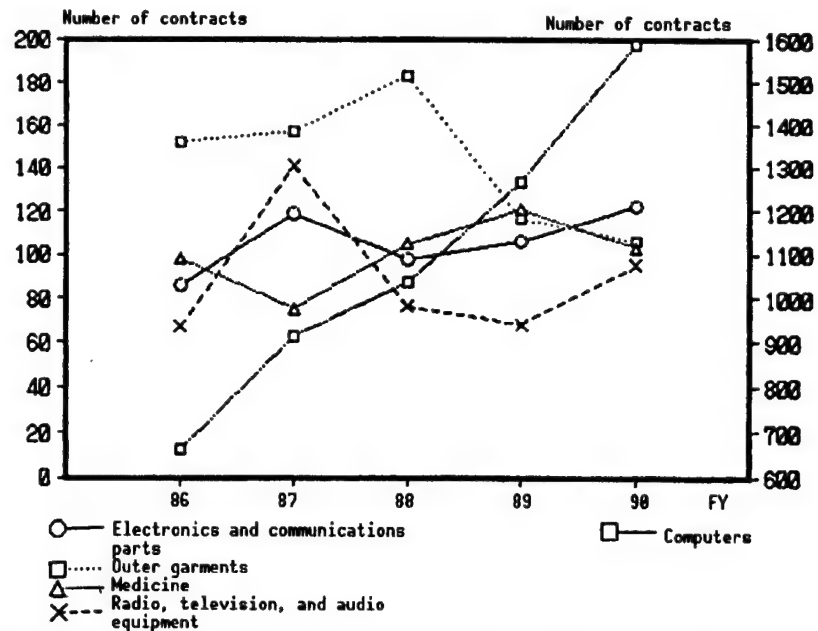


Figure 2. Number of Contracts According to Major Technology Classifications

Furthermore, if we use the technology classification (detailed classification) (Footnote) ("Detailed classification" is the lowest level of classification that consists of detailed classification or very detailed classification.) (Table 3), there were 1,588 contracts for "computers," accounting for 49.5 percent of all imported technologies. This category was followed by 122 contracts on "electronics and communications parts" (3.8 percent of the total), 106 contracts on "outer garments" (3.3 percent), 103 contracts on "medicine" (3.2 percent), and 95 contracts on "radio, television and audio equipment" (3.0 percent).

Table 3. Trends in Top Five Contracts According to Technology Classification (Detailed classification)

Technology classification (detailed classification)	FY81	FY85	FY90	Comparison to preceding year	Proportion
Computers	219	597	1588	25.2	49.5
Electronics and communications parts	71	101	122	15.1	3.8
Outer garments	167	135	106	-9.4	3.3
Medicine	77	81	103	-14.9	3.2
Radio, television, and audio equipment	84	75	95	39.7	3.0

Incidentally, "computers" accounted for 80.5 percent of "electric machinery and devices" included in the technology classification (medium-level classification).

In terms of the percentage changes from the preceding fiscal year among the top five technology classifications, we found that "radio, television and audio equipment" had the highest growth of 39.7 percent, followed by an increase of 25.2 percent in "computers." "Electronics and communications parts" grew at a rate of 15.1 percent, while "medicine" decreased by 14.9 percent and "outer garments" by 9.4 percent.

When we compared the number of contracts to that in FY81 (9 years ago) and FY85 (5 years ago), we found that the contracts for "computers" greatly increased, 7.3 times that 9 years ago and 2.7 times that 5 years ago. This category is followed by "electronics and communications parts" which grew 1.7 times that 9 years ago and 1.2 time that 5 years ago, and by "medicine" which grew 1.3 times that 9 years ago as well as 5 years ago, while "outer garments" visibly decreased to 0.63 times that 9 years ago and 0.79 times that 5 years ago.

- "Computers" accounted for 79.8 percent of the appointed technologies

When we apply the technology classification (detailed classification) to the appointed technologies, 1,561 contracts were on "computers" accounting for 79.8 percent of the appointed technologies. This category was followed by 83 contracts on "electronics and communications parts" (4.2 percent of the appointed technologies), and 57 contracts on "boilers and motors" (2.9 percent of the appointed technologies). Among the contracts for the appointed technologies whose amount exceeded ¥100 million, 552 contracts were on "computers" (64.5 percent), followed by 72 contracts for "electronics and communications parts" (8.4 percent of all the contracts for the appointed technologies and exceeding ¥100 million in amount) and 43 contracts for "tanned skin, leather products and furs" (5.0 percent of the same).

### 1.3 Imported Technologies According to Region and Country of Origin

#### (1) Imported Technologies According to Regions

- Contracts with North American firms have increased by 18.2 percent to 2,208 contracts, while those with European firms have decreased.

When we classified newly imported technologies according to their region of origin, 2,208 contracts were with firms in North America accounting for 68.8 percent of the total contracts. This figure was followed by 898 contracts with European firms (28.0 percent), 82 contracts with Asian firms (2.6 percent), 18 contracts with Oceanian firms (0.6 percent), 3 contracts with South American firms, and 2 contracts with the [former] Soviet Union.

Compared to FY89, contracts with North American firms have increased by 18.2 percent, while those with European firms have decreased by 1.2 percent. Contracts with Asian firms also have decreased by 13.7 percent.



## (2) Imported Technologies According to Countries

• Contracts with North American firms accounted for 66 percent of the total, 2,119 contracts, or 2.2 times the contracts signed 9 years ago.

According to the country of origin (Table 5), the United States topped the list with 2,119 contracts (66 percent of the total), exceeding 2,000 contracts for the first time. Other countries with more than 100 contracts were: 201 contracts with Germany (6.3 percent), 185 contracts with the

United Kingdom (5.8 percent), 158 contracts with France (4.9 percent), and 106 contracts with Switzerland (3.3 percent). These top 5 countries together accounted for 86.2 percent of all the contracts.

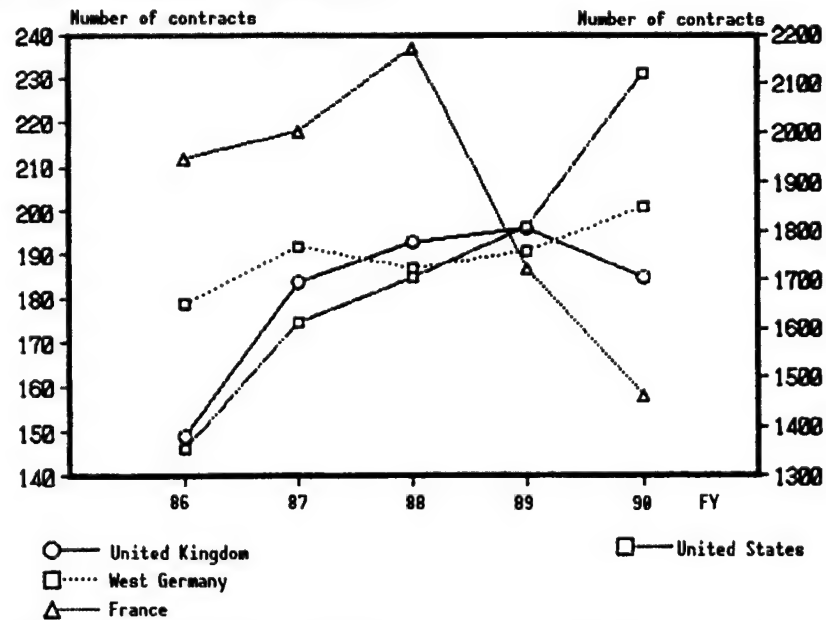


Figure 3. Trends in Major Countries of Origin of Imported Technologies

Table 5. Imported Technologies From Major Countries of Origin

Country	FY81	FY85	FY90	Comparison to preceding FY	Proportion
United States	977	1430	2119	17.2	66.0
Germany	226	204	201	2.6	6.3
United Kingdom	175	166	185	-5.6	5.8
France	224	198	158	-15.5	4.9
Switzerland	89	82	106	30.9	3.3

(Note) The number for Germany includes contracts with former East Germany.

When compared to FY89, contracts with Switzerland increased most by 30.9 percent, those with the United States increased by 17.2 percent and those with Germany also increased by 5.2 percent, while contracts with France decreased by 15.5 percent and those with the United Kingdom also decreased by 5.6 percent.

Among the top 5 countries, the United States continued to export more, or 2.2 times more than FY81 and 1.5 times more than FY85, while Germany, the United Kingdom, and Switzerland had ups and downs.

Meanwhile, France's share continued to decrease, to 0.71 times that 9 years ago and 0.80 times that 5 years ago.

- Contracts with the United States on computers amounted to 1,264, or 2.6 times that 5 years ago.

When we classified imported technologies from the top 4 countries (Table 6) according to the technology classification (medium-level classification), 1,541 contracts with the United States in "electric machinery and devices" accounted for 48.0 percent of the total, an increase of 27.1 percent from FY89. This category was followed by "general machinery and devices" and "chemical products" from the United States, and "electric machinery and devices" from the United Kingdom.

Table 6. Number of Contracts With Major Countries According to Technology Classification (Medium-level classification)

Technology classification	United States	Germany	United Kingdom	France
Electric machinery and devices	(1) 1541(724)	(1) 58(28)	(1) 92(41)	(2) 32(12)
General machinery and devices	(2) 179(181)	(2) 44(59)	(3) 14(27)	(7) 7(21)
Chemical products	(3) 123(142)	(3) 23(31)	(4) 13(13)	(10) 5(18)
Clothing and textile products	(5) 34(53)	(12) 2( 5)	(2) 20(16)	(1) 44(70)
Other products	(4) 61(82)	(5) 14(18)	(5) 10( 3)	(3) 14( 9)

When compared to the number of contracts 5 years ago, contracts for "electric machinery and devices" with the United Kingdom topped the list, or 2.2 times the contracts signed 5 years ago. This category was followed by the figure for the United States in "electric machinery and devices," which had increased to 2.1 times the number 5 years ago. Except for "electric machinery and devices," contracts for most other categories have decreased for all countries.

When we look at "computers" in the technology classification (detailed classification) for these leading countries (Table 7), 1,264 contracts with the United States firms dominated with 79.6 percent of the total, followed by the United Kingdom, Canada and Singapore. When compared to FY89, Canada's share has suddenly increased by 80.0 percent, while contracts with the United States firms have increased by 28.7 percent and those with the United Kingdom have also increased by 12.7 percent.

Table 7. Countries of Origin for the Contracts on Computers

Country	FY85	FY89	Comparison to preceding fiscal year (%)	Proportion (%)
United States	482	1264	28.7	79.6
United Kingdom	33	80	12.7	5.0
Canada	20	54	80.0	3.4
Singapore	12	39	-17.0	2.5
Germany	11	28	27.3	1.8
Total	597	1588	25.2	100.0

Contracts with Canadian firms have increased to 2.7 times those 5 years ago, those with the United States to 2.6 times and those with the United Kingdom to 2.2 times.

#### 1.4 Imported Technologies According to Advanced Technology Areas

There is no clear-cut definition of advanced technologies, but we have focused our attention to technology oriented contracts (except for trademarks) in specialized technology areas of interest (computers including hardware, software and service, semiconductors, nuclear power, aerospace, medicine, and biotechnology). We have excluded, however, those whose technological boundaries cannot be specified, such as robotics and new materials. (The number of contracts includes duplicate counts that straddle over a plural of advanced areas.)

- Contracts were concentrated on software, accounting for 1,519 transactions, or 47 percent all imported technology contracts. This was about 8 times the contracts signed 9 years ago.

Advanced technologies imported in FY90 (Table 4) were dominated by 1,519 contracts for "software," accounting for 47.3 percent of the total number of contracts. This figure was followed by 247 contracts (7.7 percent of the total) in "semiconductors," 107 contracts (3.3 percent) in "hardware," 88

contracts (2.7 percent) in "nuclear power," 80 contracts (2.5 percent) in "medicine," 39 contracts (1.2 percent) in "aerospace," and 26 contracts (0.8 percent) in "biotechnology."

Percentage comparisons with the figures of FY90 for the top 5 technologies showed that the largest increases occurred in "hardware," which increased by 25.9 percent, and in "software," which increased by 25.2 percent. "Nuclear power" increased by 8.6 percent and "semiconductor" also increased by 2.1 percent, while "medicine" decreased by 21.6 percent.

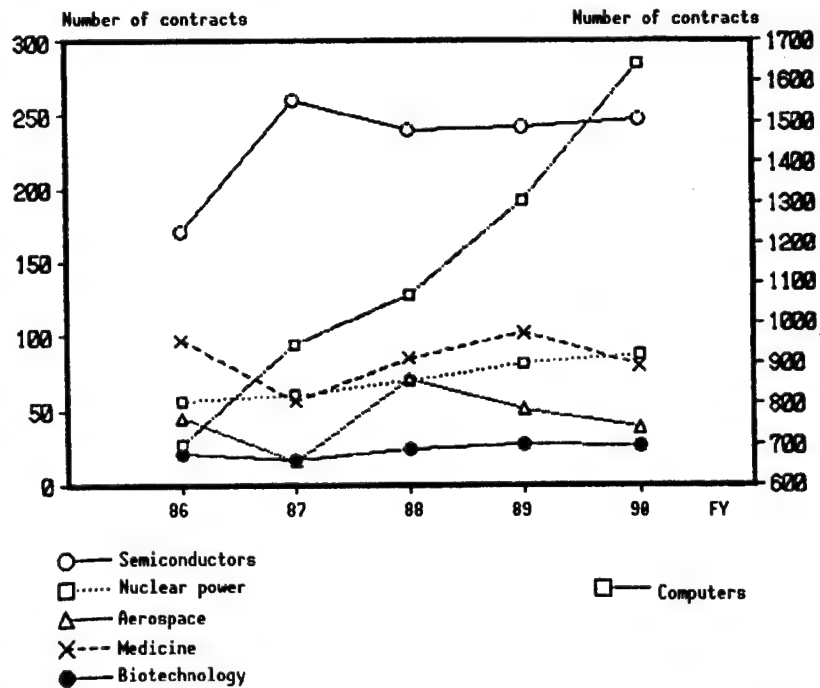


Figure 4. Trends in Importing Advanced Technologies

Table 4. Imported Advanced Technologies

Advanced technology	FY81	FY85	FY90	Comparison to preceding fiscal year (%)	Proportion (%)
Computers	224	624	1642	25.7	51.1
Hardware	30	91	107	25.9	3.3
Software	192	524	1519	25.2	47.3
Service	2	9	16	100.0	0.5
Semiconductors	36	129	247	2.1	7.7
Nuclear power	63	74	88	8.6	2.7
Aerospace	22	54	39	-23.5	1.2
Medicine	54	76	80	-21.6	2.5
Biotechnology	17	22	26	-3.7	0.8

When the number of imported technologies were compared to FY81 (9 years ago) and FY85 (5 years ago), "software" showed the largest growth, 7.9 times that 9 years ago and 2.9 times that 5 years ago.

These figures were followed by "semiconductors," which grew to 6.9 times that 9 years ago and 1.9 times that 5 years ago; "hardware," which increased 3.6 times that 9 years ago and 1.2 times that 5 years ago; "medicine," which expanded 1.5 times that 9 years ago and 1.1 times that 5 years ago; and "nuclear power," which rose 1.4 times that 9 years ago and 1.2 times that 5 years ago.

### 1.5 Technology Trade Balance

- The technology trade balance ratio (compensation received/compensation paid) was 0.43.

According to the statistics in the Monthly Report on International Balance Statistics by the Bank of Japan, compensation paid (based on actual payments) by Japan for imported technologies in FY90 was \$6.004 billion (an increase of 10.1 percent from that in FY89).

On the other hand, compensation received (based on actual receipts) for exported technologies in FY90 was \$2.582 billion (an increase of 18 percent from that in FY89). As a result, the technology trade balance ratio (compensation received/compensation paid) became 0.430, an increase of 7.2 percent from that in FY89.

When compared to 10 years ago (FY80), paid compensation increased 4.2 times, received compensation grew 6.8 times, and the balance ratio rose 1.63 times.

When compared to 5 years ago (FY85), paid compensation increased 2.4 times, received compensation grew 3.5 times, and the balance ratio rose 1.45 times.

In addition to the data on technology trade balance in the "International Balance Statistics" by the Bank of Japan, data in "Survey Report on S&T Research" prepared by

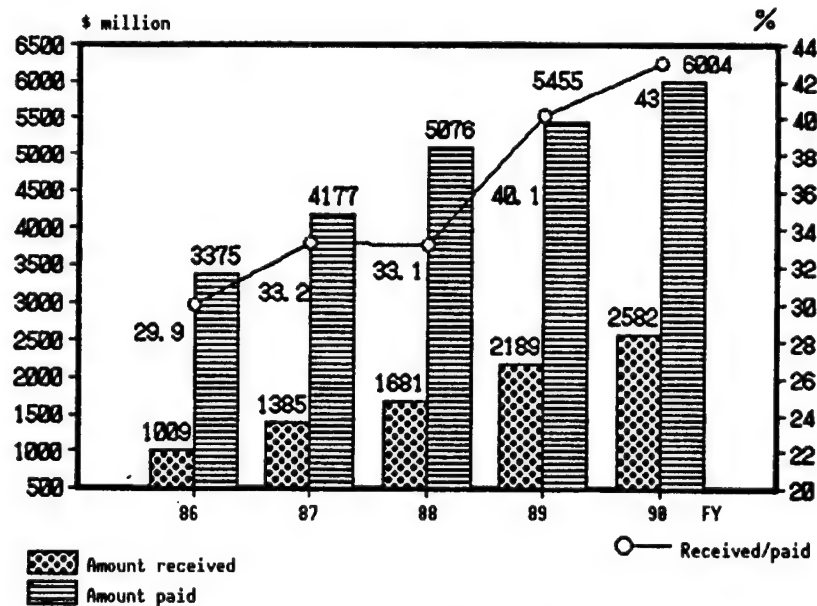


Figure 5. Trends in Japan's Technology Trade Balance  
Data from the MONTHLY REPORT ON INTERNATIONAL BALANCE STATISTICS

Note: Data on technology trade balance.

the Statistics Bureau, the Management and Coordination Agency [MCA] are also available. According to the latter, Japan's technology export in FY90 was ¥339.4 billion and technology import was ¥371.9 billion, resulting in a technology trade ratio of 0.91.

When we convert the aforementioned data from the Bank of Japan for FY90 into yen using the IMF exchange rate, technology export becomes ¥364.8 billion while technology import becomes ¥848.4 billion, indicating a substantial difference between the two sets of data.

On imported technologies, in particular, the data by the Bank of Japan exceed those by MCA by more than a factor of two. This difference indicates that importing technologies that are not included in the MCA statistics, i.e., (a) technology trade through wholesalers, retailers, and service agencies, and (b) technology trade in trademarks, designs and management technology, seems to be brisk and active.

In the past, the MCA data on technology export tended to be larger than those by the Bank of Japan, for technology trade associated with plant facilities was included in the former but not in the latter while exporting plants was thriving. In FY90, however, the Bank of Japan data are larger than the MCA data even in technology export, indicating that we should watch this trend closely.

As for the technology trade balance ratio, the results are very different in the two sets of data; hence it is necessary to take this difference into consideration when the ratio is interpreted. The difference in these two sets of statistics are highlighted below.

	Bank of Japan (International Balance Statistics)	MCA's Statistics Bureau Survey of S&T Research
Survey method	Statistics of nontrading receipts (payments) submitted to the Bank of Japan when money orders were sent or received	Questionnaires by mail (1) Exhaustive survey (All firms with capital over ¥1 billion; firms with capital under ¥1 billion but engaged in active R&D in last year's survey) (2) Selective survey (Firms with capital under ¥1 billion)
Those included in survey	Persons, corporations, and government agencies bound by nontrading contracts with nonresidents (foreign individuals, and corporations)	Universities (national, public, private) laboratories, research corporations, private firms with capital over ¥5 million, except for individuals
Those excluded from survey	None	(1) Wholesale, retail, and service businesses (2) Private firms with capital over ¥5 million (3) Firms owned by foreign investors
Analyzed data	Data recorded in the "international balance" box of nontrading receipts (payments) reports	Data recorded in "technology export" and "technology import" boxes of survey form
Covered technology	(1) Industrial proprietary rights (patents, utility models, designs, trademarks), transfer of rights about know-how, granting licenses (2) Technical guidance in plant or business management (3) Excluded plant export	(1) Offering and receiving technology, such as patents, utility models, know-how, technical guidance (2) Excluded trademarks and designs (3) Excluded guidance in plant or business management

Table 8. Trends in Technology Trading

Fiscal year	Technology trading amount		
	Receipts ( A )	Payments ( B )	A / B
	(\$ millions)	(\$ millions)	(%)
50	0. 0	2. 6	-
51	0. 0	6. 7	-
52	0. 0	9. 9	-
53	0. 1	13. 9	0. 7
54	0. 4	15. 8	2. 5
55	0. 2	20. 0	1. 0
56	0. 3	33. 3	0. 9
57	0. 2	42. 6	0. 5
58	0. 7	47. 8	1. 5
59	0. 8	61. 9	1. 3
60	2. 3	94. 9	2. 4
61	3	113	2. 7
62	7	114	6. 1
63	7	136	5. 1
64	15	156	9. 6
65	17	166	10. 2
66	19	192	9. 9
67	27	239	11. 3
68	34	314	10. 8
69	46	368	12. 5
70	59	433	13. 6
71	60	488	12. 3
72	74	572	12. 9
73	88	715	12. 3
74	113	718	15. 7
75	161	712	22. 6
76	173	848	20. 4
77	233	1027	22. 7
78	274	1241	22. 1
79	342	1260	27. 1
80	378	1439	26. 3
81	537	1711	31. 4
82	527	1796	29. 3
83	624	2079	30. 0
84	693	2317	29. 9
85	746	2522	29. 6
86	1009	3375	29. 9
87	1385	4177	33. 2
88	1681	5076	33. 1
89	2189	5455	40. 1
90	2582	6004	43. 0

Note: Amounts received and paid in compensation are taken from the MONTHLY STATISTICS OF INTERNATIONAL BALANCE by the Bank of Japan.



## 1.6 Type of Imported Technologies

### (1) Contents of Imported Technologies

#### (a) Patent-related contracts

• Patent-related contracts hardly grew, while "electric machinery and devices" accounted for 43 percent [of such contracts].

Of the new contracts importing technologies in FY90, 774 contracts dealt with patent rights (including those pending) accounting for 24.1 percent of the total. This was an increase of 1.8 percent from the contracts signed in FY89, but it hardly grew compared to 5 years ago. The FY90 figure is 0.99 times that 5 years ago.

According to the technology classification (medium-level classification) (Table 9), there were 336 contracts on "electric machinery and devices" accounting for 43.4 percent of all patent-related contracts. This category was followed by 128 contracts on "general machinery and devices" (16.5 percent of all patent-related contracts), and 124 contracts on "chemical products" (16.0 percent).

Table 9. Patent-Related Contracts According to Technology Classification  
(Medium-level classification)

Technology classification	FY85	FY90	Comparison to preceding fiscal year (%)	Proportion in all know-how-related contracts (%)
Electric machinery and devices	243	336	11.3	43.4
General machinery and devices	159	128	10.3	16.5
Chemical products	147	124	-8.1	16.0
Total	783	774	1.8	100.0

When compared to FY89, "electric machinery and devices" grew by 11.3 percent, "general machinery and device" increased by 10.3 percent, but "chemical products" decreased by 8.1 percent.

The proportions of each technology category in patent-related contracts were: 59.9 percent for "chemical products," 43.4 percent for "general machinery and devices," and 17.0 percent for "electric machinery and devices."

When compared to the contracts signed 5 years ago, "electric machinery and devices" grew by 1.4 times, while "general machinery and devices" amounted to 0.81 times, and "chemical products" to 0.84 times.

Among the contracts accompanied by patent rights, 99 contracts dealt with pending patents, a decrease of 12.4 percent compared to FY89.

**(b) Know-how-related contracts**

- Know-how-related contracts have increased—1.3 times that 5 years ago.

Know-how-related contracts reached 2,549 accounting for 79.4 percent of all imported technologies. This reflected an increase of 12.6 percent over FY89, and 1.3 times that 5 years ago.

According to the technology classification (medium-level classification) (Table 10), there are 1,798 contracts on "electric machinery and devices" accounting for 70.5 percent of know-how-related contracts. This category was followed by 262 contracts on "general machinery and devices" (10.3 percent of all know-how-related contracts) and 165 contracts on "chemical products" (6.5 percent).

Table 10. Know-How-Related Contracts According to Technology Classification  
(Medium-level classification)

Technology classification	FY85	FY90	Comparison to preceding fiscal year (%)	Proportion in all know-how-related contracts (%)
Electric machinery and devices	744	1798	27.2	70.5
General machinery and devices	312	262	1.9	10.3
Chemical products	178	165	-8.8	6.5
Total	1972	2549	12.6	100.0

When compared to FY89, contracts on "electric machinery and devices" substantially grew by more than 27.2 percent, "general machinery and devices" grew by 1.9 percent, while "chemical products" decreased by 8.8 percent.

The proportions of know-how-related contracts for each technological category were: 88.8 percent for "general machinery and devices," 91.2 percent for "electric machinery and devices," and 79.7 percent for "chemical products." When compared to the numbers 5 years ago, contracts for "electric machinery and devices" increased by 2.4 times, while contracts for "general machinery and devices" amounted to 0.84 times, and "chemical products" to 0.93 times.

**(c) Trademark-related contracts**

- Trade-mark related contracts have decreased, but contracts that involve only trademark rights have increased to 2.6 times that 5 years ago.

There were 514 contracts that dealt with trademark rights (including pending ones), accounting for 16.0 percent of all contracts. This was an increase of 0.39 percent from that in FY89, but a decrease, or 0.92 times, that 5 years ago.

According to the technology classification (medium-level classification) (Table 11), 159 contracts on "clothing and textile products" accounted for 30.9 percent of all trademark-related contracts. This figure was followed by 66 contracts on "other products" (12.8 percent of all trademark-related contracts) and 51 contract on "electric machinery and devices" (9.9 percent).

Table 11. Trademark-Related Contracts According to Technology Classification  
(Medium-level classification)

Technology classification	FY85	FY90	Comparison to preceding fiscal year (%)	Proportion in all trademark-related contracts (%)
Clothing and textile products	152	159	-9.7	30.9
Other products	59	66	1.5	12.8
Electric machinery and devices	59	51	41.7	9.9
Total	556	514	0.4	100.0

When compared to FY89, "electric machinery and devices" increased by 4 1.7 percent, "other products" grew by 1.5 percent, but "clothing and textile products" decreased by 9.7 percent.

The proportion of trademark-related contracts for each technology area were: 100 percent in "clothing and textile products," 51.2 percent in "other products," and 2.6 percent in "electric machinery and devices." When compared to the number of contracts 5 years ago, the FY90 number in "clothing and textile products" was 1.0 times, that in "other products" was 1.1 times, and that in "electric machinery and devices" was 0.88 times.

There were 407 contracts dealing with trademark rights only, accounting for 12.7 percent of the total. This was an increase of 8.0 percent from that in FY89 and 2.6 times that 5 years ago. In terms of the technology classification (medium-level classification), contracts on "clothing and textile products" increased to 5.4 times, and those on "tanned skin, leather products and furs" also increased 7.5 times over the figures 5 years ago.

## (2) Importing unindustrialized technologies

Among new contracts signed for technology import in FY90, there were 1,840 contracts that belonged to "unindustrialized technologies," i.e., technologies

that had not been industrialized by the provider of such technologies. This was an increase of 255 contracts (16.1 percent).

In terms of the technology classification (medium-level classification), there were 1,353 contracts for "electric machinery and devices," which represent an increase of 277 contracts (25.7 percent) over those in FY89, or 73.5 percent of all "unindustrialized technologies."

This was followed by 99 contracts (an increase of 33.8 percent from that in FY89) on "general machinery and devices," 83 contracts on "chemical products" (a decrease of 12.6 percent from that in FY89), 77 contracts for "clothing and textile products" (a decrease of 4.9 percent), and 58 contracts on "other products" (a decrease of 14.7 percent).

### 1.7 Characteristics of Contract Conditions

#### (1) Compensation payment conditions

- There were 182 contracts stipulating no compensation, representing an increase of 21.3 percent from that in FY89.

According to the compensation payment conditions stipulated in contracts for newly imported technologies in FY90, 182 contracts specified no compensation. This figure was 5.7 percent of the total contracts and represented an increase of 21.3 percent from that in FY89.

In terms of the technology classification (medium-level classification), 102 contracts were on "electric machinery and devices", a large increase of 67.2 percent from that in FY89. This category was followed by 28 contracts on "chemical products" (a decrease of 17.6 percent from that in FY89) and 14 contracts for "general machinery and devices" (an increase of 40.0 percent).

There were 3,029 contracts with compensation payments, or 94.3 percent of the total, representing an increase of 10.2 percent from that in FY89.

- Contracts requiring initial payments only constituted 42.2 percent of all contracts.

Among contracts with compensation, 1,355 contracts required "an initial payment only," accounting for 42.2 percent of the total, or an increase of 13.8 percent from that in FY89 (Table 12).

In terms of the technology classification (medium-level classification) (Table 13), the majority consisted of 1,025 contracts on "electric machinery and devices," an increase of 21.0 percent from that in FY89. This category was followed by 124 contracts for "general machinery and devices" (an increase of 10.7 percent from that in FY89) and 47 contracts for "chemical products" (a decrease of 13.0 percent).

Table 12. Compensation Payment Conditions

Compensation condition	FY90	Comparison to FY89 (%)	Proportion (%)
Initial payment only	1355	13.8	42.2
Initial payment + running royalty	737	13.7	23.0
Running royalty only	541	13.7	16.8
Running royalty + minimum payment	274	-5.8	8.5
Initial payment + running royalty + minimum payment	122	-14.1	3.8

Table 13. Compensation Payment Conditions for Contracts for Top Five Categories in Technology Classification (Medium-level classification)

Compensation payment condition	Electric machinery and devices	General machinery and devices	Chemical products	Clothing and textile products	Other products
Initial payment only	1025(847)	124(112)	47(54)	24(35)	25(24)
Initial payment + royalty	461(362)	78(68)	63(67)	3 (4)	27(27)
Running royalty only	319(257)	52(55)	40(46)	26(23)	23(18)
Running royalty + minimum payment	28 (37)	7(12)	8 (7)	93(105)	36(40)
Initial payment + running royalty + minimum payment	37 (40)	20(26)	21(20)	6 (8)	7(12)

In terms of proportions by technological category, "electric machinery and devices" constituted 52.0 percent, "general machinery and devices" amounted to 42.0 percent, and "chemical products" accounted for 22.7 percent.

There were 737 contracts stipulating "an initial payment plus a running royalty," representing 23.0 percent of all contracts and an increase of 13.7 percent from that in FY89.

In terms of the technology classification (medium-level classification), 461 contracts were on "electric machinery and devices" (an increase of 27.3 percent from that in FY89), 78 contracts for "general machinery and devices" (an increase of 14.7 percent) and 63 contracts for "chemical products" (a decrease of 6.0 percent).

There were 541 contracts stipulating "a running royalty only," representing 16.8 percent of all contracts and an increase of 13.7 percent from that in FY89.

In terms of the technology classification (medium-level classification), 319 contracts were on "electric machinery and devices" (an increase of 24.1 percent from that in FY89), 52 contracts for "general machinery and devices" (a decrease of 5.5 percent) and 40 contracts for "chemical products" (a decrease of 13.0 percent).

There were 274 contracts stipulating "a minimum payment plus a running royalty," representing 8.5 percent of all contracts and a decrease of 5.8 percent from that in FY89.

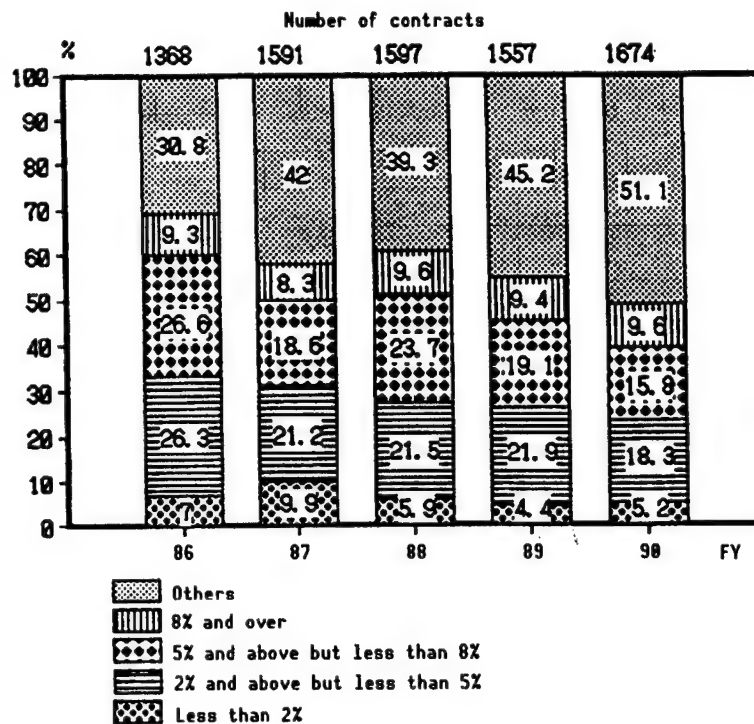
In terms of the technology classification (medium-level classification), 93 contracts were on "clothing and textile products" (a decrease of 11.4 percent from that in FY89), 36 contracts on "other products" (a decrease of 10.0 percent) and 34 contracts for "tanned skin, leather products and furs" (a decrease of 2.9 percent).

There were 122 contracts stipulating "an initial payment plus a minimum payment and a running royalty," representing 3.8 percent of all contracts and a decrease of 14.1 percent from that in FY89.

• With a running royalty, over 50 percent of all contracts stipulated "other" rates.

A total of 1,674 contracts, or 52.1 percent of the total, stipulated a running royalty. This figure was an increase of 7.5 percent from that in FY89, and amounts to 1.2 times that 5 years ago.

In terms of rates (Table 14), the majority, 856 contracts, stipulated "other" rates (Footnote) ("Other" rates are those other than a percentage payment, such as payment per unit product.), accounting for 51.1 percent of all contracts with a running royalty and exceeding 50 percent for the first time. This was followed by 306 contracts (18.3 percent of all contracts) stipulating rates "2 percent and above but less than 5 percent," 264 contracts (15.8 percent of all contracts) with rates "5 percent and above but less than 8 percent," 160 contracts (9.6 percent) with rates "8 percent and above," and 88 contracts (5.3 percent) with rates "less than 2 percent."



Note: Numbers indicate percentage proportion to all contracts stipulating a running royalty.

Figure 6. Percentage Description of Trends in Running Royalties

Table 14. Status of Running Royalties

Royalty rate	FY85	FY90	Comparison to preceding fiscal year (%)	Proportion (%)
Less than 2%	93	88	29.4	5.3
2% and above but less than 5%	356	306	-10.5	18.3
5% and above but less than 8%	362	264	-11.1	15.8
8% and above	137	160	9.6	9.6
Others	488	856	21.6	51.1
Total	1436	1674	7.5	100.0

When compared to FY89, the largest increase of 29.4 percent occurred in contracts with rates "less than 2 percent," those with "other" rates increased by 21.6 percent, and those with rates "8 percent and above" increased by 9.6 percent. The number of contracts with other rates have decreased.

When these rates are compared to those used 5 years ago, "other" rates increased 1.8 times, "8 percent and above" rates increased 1.2 times, but others rates decreased: "5 percent and above but less than 8 percent" rates by 0.73 times, "2 percent and above but less than 5 percent" rates by 0.86 times, and "less than 2 percent" by 0.95 times.

Table 15. Running Royalties According to Major Technology Classification (Medium-level classification)

Royalty rate	Electric machinery and devices	General machinery and devices	Chemical products	Clothing and textile products
Less than 2%	35 (6.1)	6 (200.0)	12 (20.0)	9 (80.0)
2% and above but less than 5%	68 (-1.4)	49 (22.5)	40 (-28.6)	32 (-17.9)
5% and above but less than 8%	20 (-33.3)	32 (-8.6)	34 (-10.5)	54 (-23.9)
8% and above	61 (-1.6)	11 (10.0)	13 (-23.5)	21 (61.5)
Others	661 (31.7)	59 (-20.3)	33 (73.7)	12 (0.0)
Total	845 (21.4)	157 (-2.5)	132 (-5.7)	128 (-8.6)

Note: Figures in ( ) are percentage comparison to FY89.

In terms of the technology classification (medium-level classification) (Table 15), the majority, 661 contracts (an increase of 31.7 percent from that in



FY89), of "electric machinery and devices" stipulated "other" rates, and this category accounted for 78.2 percent of all contracts with running royalties. The most common payment conditions in "general machinery and devices" were 59 contracts (a decrease of 20.3 percent from that in FY89) stipulating "other" rates; those in "chemical products" were 40 contracts (a decrease of 28.6 percent) stipulating "2 percent and above but less than 5 percent" rates; and those in "clothing and textile products" were 54 contracts (a decrease of 23.9 percent) stipulating "5 percent and above but less than 8 percent" rates.

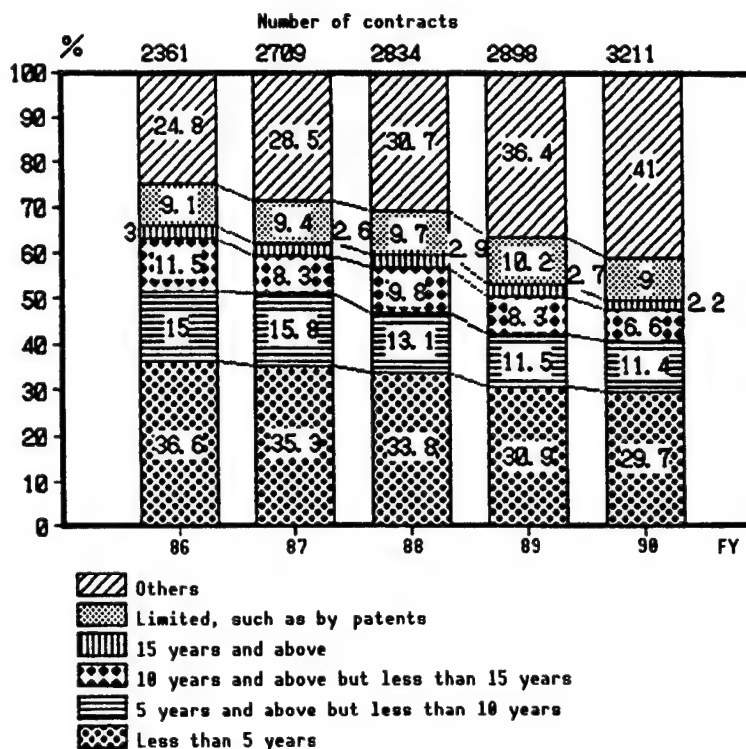


Figure 7. Trends in Contract Periods

## (2) Contract period

- "Other" contract periods accounted for 41 percent.

When new imported technology contracts signed during FY90 (3,211 contracts) were analyzed (Table 16), 1,315 contracts with "other" periods (Footnote) ("Other" periods include contracts with no periods, permanent periods, or those stipulating until other contracts expire.) accounted for 41.0 percent of all contracts. This figure was followed by 811 contracts (25.3 percent of the total) with "1 year and above but less than 5 years," 367 contracts (11.4 percent) with "5 years and above but less than 10 years," 289 contracts (9.0 percent) with "limited by such as patents," 213 contracts (6.6 percent) with "10 years and above but less than 15 years," 144 contracts (4.5 percent) with "less than 1 year," and 72 contracts (2.2 percent) with "15 years and above."

The percentage comparison to FY89 for "other" periods increased by 24.5 percent, by 24.1 percent for "less than 1 year," by 10.5 percent for "5 years and above but less than 10 years," and by 4.1 percent for "1 year and above but less than 5 years," while "10 years and above but less than 15 years" decreased by 11.6 percent, "15 years and above" by 7.7 percent and "limited by such as patents" by 2.4 percent.

When compared to 5 years ago, the proportion of contracts that did not spell out contract periods have greatly increased by 1.9 times.



Table 16. Status of Contract Periods

Contract period	FY85	FY90	Comparison to preceding fiscal year (%)	Proportion (%)
Less than 1 year	170	144	24.1	4.5
1 year and above but less than 5 years	760	811	4.1	25.3
5 years and above but less than 10 years	365	367	10.5	11.4
10 years and above but less than 15 years	238	213	-11.6	6.6
15 years and above	75	72	-7.7	2.2
Until patents expire	-	289	-2.4	9.0
Others	828	1315	24.5	41.0

Note: Contracts listed under (Others) in FY85 column include those limited to effective periods of patents.

Table 17. Contract Periods According to Major Technology Classifications (Medium-level classification)

Contract period	Electric machinery and devices	General machinery and devices	Chemical products	Clothing and textile products
Less than 1 year	67 ( 3.1)	25(108.3)	10 ( 0.0)	18(125.0)
1 year and above but less than 5 years	413 ( 9.8)	75 (13.6)	32 (45.5)	97(-16.4)
5 years and above but less than 10 years	167 (47.8)	65 ( 0.0)	17 (-34.6)	24(-27.3)
10 years and above but less than 15 years	79 (-1.3)	48 ( 0.0)	21 (-34.4)	1(-66.7)
15 years and above	13(-51.9)	8(-20.0)	20 ( 53.8)	1( - )
Until patents expire	154 ( 9.2)	24 ( 9.1)	47 (-16.1)	1(-50.0)
Others	1079(34.5)	50(-16.7)	60 (-13.0)	17(-15.0)

Note: Figures in ( ) are percentage comparison to FY89.

In terms of the technology classification (medium-level classification) (Table 17), 1,079 contracts (an increase of 34.5 percent from that in FY89) with "other" periods dominated the "electric machinery and devices" category, accounting for 54.7 percent of all contracts for this category. The most common contract periods in "general machinery and devices" were 75 contracts (an increase of 13.6 percent from that in FY89) with "1 year and above but less than 5 years," 60 contracts (a decrease of 13.0 percent) for "chemical

products" with "other" periods, and 97 contracts (a decrease of 16.4 percent) for "clothing and textile products" with "1 year and above but less than 5 years."

### (3) Export market

- Contracts "restricted to Japan only" accounted for 61.2 percent, while those "allowed throughout the world" have increased by 21 percent compared to FY89.

In terms of the countries to which products manufactured using new technologies imported in FY90 could be exported (Table 18), 1,964 contracts restricted the sale of the products to "Japan only" (export forbidden), accounting for 61.2 percent of all contracts. This figure was followed by 879 contracts (27.4 percent of the total) that permitted to sell "throughout the world" (no restrictions), 196 contracts (6.1 percent) that stipulated "others," i.e., name specific countries or regions, 128 contracts (4.0 percent) that extended sales to "include Asia," 40 contracts (1.2 percent) that extended sales to "include Korea and Taiwan," and 4 contracts (0.1 percent) that extended sales to "include Europe and America."

Table 18. Status of Restrictions on Export Market

Marketing restriction	FY85	FY90	Comparison to preceding fiscal year (%)	Proportion (%)
Japan only	1327	1964	9.4	61.2
Includes Korea and Taiwan	42	40	21.2	1.2
Includes Asia	150	128	-5.9	4.0
Includes Europe and America	7	4	-	0.1
Throughout the world	659	879	21.1	27.4
Others	251	196	-3.4	6.1

In percentage comparisons to FY89, "throughout the world" contracts greatly increased by 21.1 percent along with those extended sales to "include Korea and Taiwan," which also grew by 21.2 percent. On the other hand, "Japan only" contracts increased by 9.4 percent.

When compared to 5 years ago, "Japan only" contracts grew 1.5 times and "throughout the world" contracts increased 1.3 times, while the rest decreased.

In terms of technology classification (Table 19), 1,203 (an increase of 22.3 percent compared to FY89) contracts on "electric machinery and devices" were restricted to "Japan only," accounting for 61.0 percent of this category. This figure was followed by 672 contracts (an increase of 31.3 percent) that

permitted sales "throughout the world," accounting for 34.1 percent of contracts on "electric machinery and devices." As for "general machinery and devices," 149 contracts limited sales to "Japan only," and 46 contracts extend sales to "include Asia." There were 103 contracts on "chemical products" that limited sales to "Japan only," and 57 contracts for sales "throughout the world."

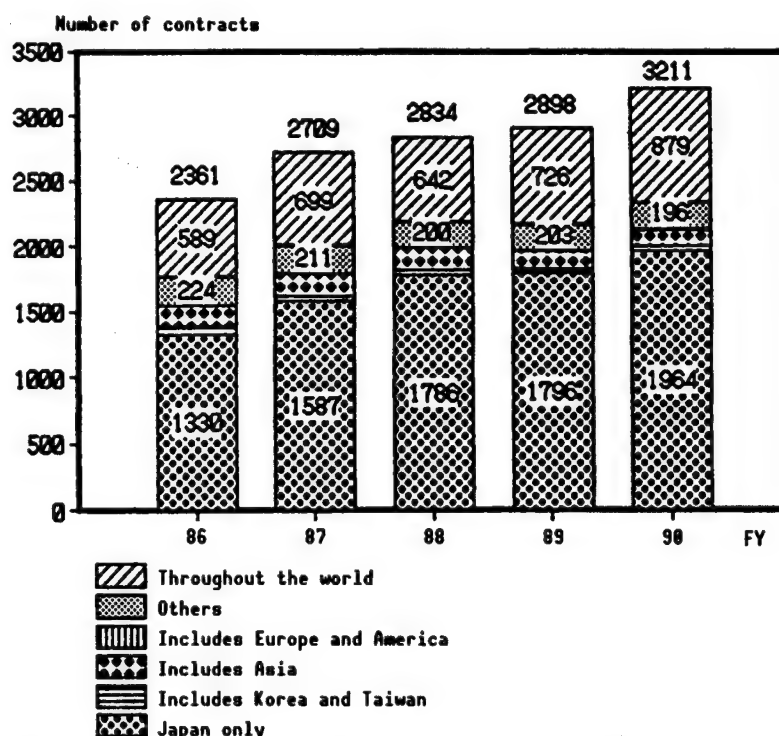


Table 19. Marketing Restrictions According to Major Technology Classifications

(Medium-level classification)

Marketing restriction	Electric machinery and devices	General machinery and devices	Chemical products	Clothing and textile products
Japan only	1203( 22.3)	149(-1.3)	103(-16.9)	133(-14.2)
Includes Korea and Taiwan	5(-37.5)	13(44.4)	12( 50.0)	5(150.0)
Includes Asia	17(-45.2)	46(24.3)	13(-23.5)	15( 50.0)
Includes Europe and America	3(200.0)	-( - )	-( - )	1( - )
Throughout the world	672( 31.3)	45(-4.3)	57 ( 7.5)	1(-88.9)
Others	72( 5.9)	42( 7.7)	22 (-8.3)	4(-33.3)

Note: Figures in ( ) are percentage comparison to FY89.

#### (4) Exclusive rights in Japan

• Contracts with exclusive rights constituted 37 percent of the total, while "electric machinery and devices" grew 2.3 times that 5 years ago.

Among the contracts signed in FY90 to import new technologies, 1,188 contracts provided exclusive rights in Japan, accounting for 37.0 percent of the total.

This was an increase of 7.3 percent from that in FY89, and 1.1 times that 5 years ago.

In terms of the technology classification (medium-level classification) (Table 20), 519 contracts concerned "electric machinery and devices" accounting for 43.7 percent of contracts stipulating exclusive rights. This figure was followed by 130 contracts (10.9 percent of all contracts providing exclusive rights) on "clothing and textile products," 127 contracts (10.7 percent) on "general machinery and devices," and 105 contracts (8.8 percent) on "chemical products."

Table 20. Trends in [Contracts Granting] Exclusive Rights According to Major Technology Classification  
(Medium-level classification)

Technology classification	FY85	FY90	Comparison to preceding fiscal year (%)	Proportion (%)
Electric machinery and devices	227	519	14.8	43.7
General machinery and devices	166	127	14.4	10.6
Chemical products	108	105	20.7	8.8
Clothing and textile products	173	130	-11.6	10.9
Total	1054	1188	7.3	100.0

In terms of percentage comparison to FY89, [exclusive] contracts on "chemical products" have increased by 20.7 percent, those on "electric machinery and devices" have increased by 14.8 percent, and those on "general machinery and devices" also have increased by 14.4 percent.

When compared to those 5 years ago, only "electric machinery and devices" increased 2.3 times, while the rest decreased.

#### (5) Cross-licensing contracts

- There were 89 contracts that provided cross licensing.

Among the contracts that imported new technologies in FY90, 89 contracts, or 2.8 percent of the total, stipulated cross licensing, i.e., the contracts involved importing and exporting technologies on a mutual basis. This figure was a decrease of 6.3 percent compared to FY89, and 0.98 times that 5 years ago.

In terms of the technology classification (medium-level classification) (Table 21), 54 contracts were on "electric machinery and devices," accounting for 60.7 percent of all cross licensing contracts. This figure was followed by 9 contracts each for "chemical products" and "general machinery and devices."

Table 21. Trends in [Contracts Granting] Cross-Licensing According to Major Technology Classification  
(Medium-level classification)

Technology classification	FY85	FY90	Proportion (%)
Electric machinery and devices	39	54	60.7
General machinery and devices	20	9	10.1
Chemical Products	18	9	10.0
Total	91	90	100.0

When the top 3 categories in the technology classification were compared to the figures 5 years ago, only "electric machinery and devices" have increased 1.4 times, while the rest have decreased.

(6) Technology import accompanied by stock ownership

- There were 16 contracts that provided stock ownership.

If a foreign firm invests in Japan, participates in management by owning stocks, and brings technology as part of this transaction, then such a transaction is defined as "imported technology accompanied by stock ownership."

There were 16 contracts that "imported technology accompanied by stock ownership" in FY90, representing an increase of 1 contract and 0.67 times that 5 years ago. In terms of the technology classification (medium-level classification) (Table 22), 7 contracts were on "chemical products," accounting for 43.8 percent of the total. There were 2 contracts each on "general machinery and devices," "precision machinery," and "electric machinery and devices."

Table 22. Imported Technology Accompanied by Stock Ownership According to Major Technology Classification  
(Medium-level classification)

Technology classification	FY85	FY90	Proportion (%)
Electric machinery and devices	3	2	12.5
General machinery and devices	7	2	12.5
Chemical Products	7	7	43.8
Precision machinery	1	2	12.5
Total	24	16	100.0

### (7) Resale rights

- There were 1,017 contracts that permitted resale [of imported technology], representing an increase of 25 percent from that in FY89.

Among the contracts importing new technologies in FY90, 1,017 contracts, or 31.7 percent of all contracts, granted rights to transfer an imported technology to a third party. This figure was an increase of 24.9 percent compared to that in FY89, and 1.5 times more than that 5 years ago.

In terms of the technology classification (medium-level classification) (Table 23), 582 contracts dealt with "electric machinery and devices" accounting for 57.2 percent of the contracts permitting resales. This category was followed by 89 contracts on "chemical products," 76 contracts on "clothing and textile products," and 75 contracts on "general machinery and devices."

Table 23. Trends in Resale Rights According to Major Technology Classification (Medium-level classification)

Technology classification	FY85	FY90	Comparison to preceding fiscal year (%)	Proportion (%)
Electric machinery and devices	228	582	37.6	57.2
General machinery and devices	85	75	10.3	7.4
Chemical products	82	89	36.9	8.8
Clothing and textile products	92	76	-13.6	7.5
Total	694	1087	24.9	100.0

When compared to FY89, [contracts on] "electric machinery and devices" increased by 37.6 percent, "chemical products" increased by 36.9 percent, and "general machinery and devices" also increased by 10.3 percent.

Of these 4 top categories, "electric machinery and devices" increased 2.6 times that 5 years ago, "chemical products" increased 1.1 times, but others decreased.

### (8) Imported technologies classified according to capital funds

- Size of capital funds polarized into two categories.

In terms of capital funds for new technologies imported in FY90 (Table 24), 985 contracts involved funds "¥50 billion or more," accounting for 30.7 percent of all contracts. This was followed by 542 contracts (16.9 percent of all contracts) involving "¥10 billion or more but less than ¥50 billion," 518 contracts (16.1 percent) involving "¥100 million or more but less than ¥500 million," 357 contracts (11.1 percent) involving "¥1 billion or more but less

Table 24. Trends in Imported Technologies According to Capital Funds

Capital fund size	FY85	FY90	Comparison to preceding fiscal year (%)	Proportion (%)
Less than ¥50 million	363	296	17.9	9.2
¥50 million or more but less than ¥100 million	171	248	38.5	7.7
¥100 million or more but less than ¥500 million	285	518	4.0	16.1
¥500 million or more but less than ¥1 billion	112	74	-14.9	2.3
¥1 billion or more but less than ¥5 billion	340	357	0.3	11.1
¥5 billion or more but less than ¥10 billion	193	172	-7.5	5.4
¥10 billion or more but less than ¥50 billion	516	542	7.3	16.9
¥50 billion or more	445	985	19.7	30.7
Unknown	11	19	46.2	0.6

Unknown: Foundations, corporations, public organizations, incorporated schools, corporations with special status, individuals, etc.

than ¥5 billion," and 248 contracts (7.7 percent) involving "¥50 million or more but less than ¥100 million."

When compared to FY89, "¥50 million or more but less than ¥100 million" category had the largest increase of 38.5 percent. This was followed by an increase of 19.7 percent in the category of "¥50 billion or more," an increase of 17.9 percent in "less than ¥50 million," and an increase of 7.3 percent in "¥10 billion or more but less than ¥50 billion."

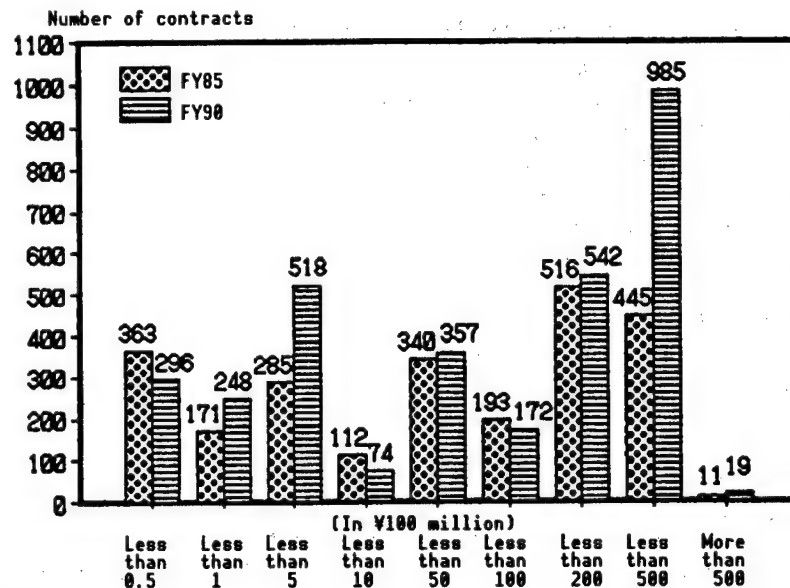


Figure 9. Number of Contracts According to Capital Fund Size

When compared to 5 years ago, "¥50 billion or more" increased 2.2 times, "¥100 million or more but less than ¥500 million" increased 1.8 times, "¥50 million

or more but less than ¥100 million" increased by 1.5 times, and both "¥10 billion or more but less than ¥50 billion" and "¥1 billion or more but less than ¥5 billion" increased 1.1 times.

In terms of the technology classification (medium-level classification) (Table 25), the most common contracts were 722 contracts for "electric machinery and devices" involving [capital funds of] "¥50 billion or more," accounting for 36.6 percent of all contracts for "electric machinery and devices." This was followed by 384 contracts involving "¥100 million or more but less than ¥500 million" accounting for 19.5 percent. When compared to FY89, contracts involving "¥50 million or more but less than ¥100 million" increased most by 66.3 percent, followed by an increase of 36.0 percent involving "¥500 million or less" and an increase of 31.8 percent involving "¥50 billion or more." In the category of "general machinery and devices," the largest increase was 103 contracts involving "¥50 billion or more," accounting for 34.9 percent of all contracts for "general machinery and devices." In the category of "chemical products," the largest increase, 79 contracts, involved "¥10 billion or more but less than ¥50 billion," accounting for 38.2 percent of all contracts on "chemical products."

Table 25. Capital Funds According to Major Technology Classification  
(Medium-level classification)

Capital fund size	Electric machinery devices	General machinery and devices	Chemical products
Less than ¥50 million	117 (36.0)	28 (40.0)	18 (125.0)
¥50 million or more but less than ¥100 million	163 (66.3)	24 (140.0)	6 (-33.3)
¥100 million or more but less than ¥500 million	384 (15.3)	20 (-44.4)	19 (-29.6)
¥500 million or more but less than ¥1 billion	40 (-2.4)	9 (-30.8)	10 ( 0.0)
¥1 billion or more but less than ¥5 billion	208 ( 8.3)	28 (12.0)	27 (-22.9)
¥5 billion or more but less than ¥10 billion	88 (-6.4)	20 (53.8)	25 (-19.4)
¥10 billion or more but less than ¥50 billion	238 (14.4)	61 (-9.0)	79 ( 11.3)
¥50 billion or more	722 (31.8)	103 ( 5.1)	21 (-38.2)
Unknown	12 (200.0)	2 (100.0)	2 (-33.3)
Total	1972 (22.9)	295 ( 4.2)	207 (-9.2)

Unknown: Foundations, corporations, public organizations, incorporated schools, corporations with special status, individuals, etc.

Figures in ( ) are percentage coparison to FY89.



#### **(9) Technology import by foreign-invested firms**

There were 94 contracts on technologies imported by a nonresident, who owned more than one-half of resident stocks or ownership, accounting for 2.9 percent of all contracts. This was a decrease of 9.6 percent from that in FY89.

In terms of the technology classification (medium-level classification), 42 contracts were on "electric machinery and devices" (44.7 percent of technologies imported by foreign-invested firms), 23 contracts on "chemical products" (24.5 percent), 9 contracts on "general machinery and devices" (9.6 percent), and 7 contracts are on "other products" (7.4 percent).

In terms of the proportions of these contracts in each of the technology classifications, [technologies imported by foreign-invested forms] amounted to 11.1 percent in "chemical products" (11.8 percent in FY89), 5.4 percent in "other products" (3.0 percent in FY89), 3.1 percent in "general machinery and devices" (3.2 percent in FY89), and 2.1 percent in "electric machinery and devices" (2.7 percent in FY89).

In terms of restrictions on resale of technologies imported by foreign-invested firms, 10.6 percent of contracts [by foreign firms] in FY90 had no restrictions (27.9 percent of contracts by other firms), while 4.8 percent of contracts [by foreign firms] in FY89 (25.8 percent of contracts by other firms) had no restrictions.

#### **1.8 Characteristics of Amended Contracts**

- Amending "running royalties" accounted for 47 percent of 1,283 amended contracts.

There were 1,283 amended contracts in FY90, an increase of 97 contracts (8.2 percent) compared to the last fiscal year.

Of these, 293 contracts amended the contractors, i.e., "succession of position," accounting for 22.8 percent of all amended contracts. This was an increase of 23.6 percent from FY89. Of the 293 contracts, 206 contracts involved only "succession of position," while 1,077 contracts amended the content of existing contracts, representing an increase of 7.4 percent compared to FY89.

The most common changes were amendments in "running royalties," involving 506 contracts, or 47.0 percent of all amended contracts. This was followed by 460 contracts (42.7 percent) amending "contract period," 357 contracts (33.1 percent) amending "technological scope," 279 contracts (25.9 percent) amending "initial payments," and 218 contracts (20.2 percent) amending "minimum payments."

When compared to FY89, the largest increase of 39.5 percent was observed in amendments of "technological scope," which was followed by an increase of 17.2 percent in amendments of "minimum payments," and an increase of 11.2 percent in amendments of "running royalties."

Amended items were dominated by increases: 93.9 percent increased "initial payments," 93.5 percent extended "contract periods," and 90.8 percent expanded "technological scope." When compared to FY89, the largest increase of 43.4 percent dealt with expanded "technological scope," followed by an increase of 24.4 percent involving increased "running royalties," and an increase of 19.1 percent involving increased "minimum payments." Meanwhile, sizable "decreases" occurred in 23.7 percent of contracts involving lower "running royalties" and 21.6 percent involving lower "minimum payments."

## Part II. Statistical Tables

Table A. List of Appointed [Targeted] Technologies

Item	Scope of technology
1. Aircraft	(1) Aircraft manufacturing technology (2) Technology for manufacturing aircraft parts or accessories
2. Weapons	(1) Technology for manufacturing weapons (2) Technology for manufacturing weapon parts or accessories (3) Technology for manufacturing electronic equipment for military applications
4. Nuclear power	(1) Technology for manufacturing or utilizing nuclear reactors (including fusion reactors—same for items listed below), or their parts, accessories and structural materials; turbines or generators for nuclear power generation. (2) Technology for manufacturing, utilizing or reprocessing nuclear fuel, or devices for such purposes. (3) Technology for manufacturing or utilizing devices to generate radiation; technology for utilizing radioactive materials, processing such materials, or manufacturing devices for such purposes (4) Technology for utilizing nuclear reactions in devices other than nuclear reactors.
5. Space development	(1) Technology for manufacturing or utilizing spacecraft (except for the rockets for weather observation—same for items listed below) or testing devices specially designed to launch, guide and control, track or utilize such spacecraft. (2) Technology for manufacturing or utilizing testing devices specially designed to develop spacecraft (3) Technology for manufacturing or utilizing thrust sources of spacecraft, or parts, accessories or materials exclusively for use in (1) or (2) above.
6. Computers	(1) Technology for manufacturing computers (including accessories). (2) Technology for manufacturing devices for application of computers. (3) Technology for utilizing (1) or (2) above.

[continued]

[Continuation of Table A]

Item	Scope of technology
7. Electronic parts and future computers	<p>(1) Technology for manufacturing ultra-large scale integrated circuits: Ultra-large scale integrated circuits are fabricated using microprocessing technologies, such as electron-beam exposure technology and x-ray exposure technology, and each integrated circuit device contains circuitry equivalent to more than 100,000 transistors and diodes.</p> <p>(2) Technology for manufacturing new logic devices and new memory devices: New logic and memory devices, such as superconducting devices, micro wave semiconductor devices and optical devices, are those based on principles different from conventional ones.</p>
8. Equipment related to laser processing and optical communications	<p>(1) Technology for manufacturing laser oscillators and light emitting and receiving semiconductor devices for optical communications.</p> <p>(2) Technology for manufacturing optical fibers and optical circuits.</p>
9. Innovative new materials	<p>(1) Technology for manufacturing amorphous metals.</p> <p>(2) Technology for manufacturing superconducting materials.</p>
10. Electrolysis of table salt without mercury	Technology to manufacture sodium hydroxide, chlorine or hydrogen by electrolyzing table salt without mercury.
11. Seabed petroleum production	Technology for manufacturing equipment to produce oil and inflammable natural gas from seabed oil wells, and technology to install and utilize such equipment (limited to those used in oil wells 200-meter deep or more). Technologies that use platforms are excluded.
12. Leather or leather products	<p>(1) Technology for manufacturing leather or leather products.</p> <p>(2) Industrial proprietary rights concerning leather or leather products.</p>

Table B. Comparison Between the Technology Classification [used in this report] and the Japan Standard Industrial Classification [JSIC]

Code	Technology classification [by industry]	JSIC [by industry]
01	All industries	
02	Agricultural, forestry, and fishing	A. Agricultural B. Forestry C. Fishing
03	Mining	D. Mining
04	Construction	09. Comprehensive construction business 10. Construction business by craft (excluding installation business) 11. Installation business
05	Manufacturing	
11	Food and tobacco	121. Manufacturing of food from animal products 122. Manufacturing of food from marine products 123. Manufacturing of canned vegetables, canned fruits, and preserved agricultural food products 124. Manufacturing of seasoning products 125. Manufacturing of saccharide products 126. Manufacturing of refined grain and flour 127. Manufacturing of bread and cakes 128. Manufacturing of animal and vegetable oil and fat 129. Manufacturing of other food products 131. Manufacturing of nonalcoholic beverages 132. Manufacturing of alcoholic beverages 133. Manufacturing of tea and coffee products 134. Manufacturing of ice 135. Manufacturing of animal feed and organic fertilizers 136. Manufacturing of tobacco
12	Textile	141. Reeling 142. Spinning 143. Twisted yarn manufacturing 144. Textile 145. Knitted product 146. Dyeing 147. Rope and net manufacturing 148. Lace and miscellaneous textile manufacturing 149. Other textile

[continued]

[Continuation of Table B]

Code	Technology classification [by industry]	JSIC [by industry]
13	Clothing and textile products	
14	Outer garments	151. Outer garment manufacturing (excluding Japanese style clothing)
15	Other clothing and textile products	152. Shirt and underwear manufacturing (excluding Japanese style clothing) 153. Hat manufacturing 154. Fur clothing, accessory manufacturing 155. Other clothing, textile accessory manufacturing (including Japanese style products) 156. Other textile product manufacturing
16	Lumber, wood products, furniture, etc.	16. Lumber, wood product manufacturing (excluding furniture) 17. Furniture and fixture manufacturing
17	Pulp, paper products, printing	18. Pulp, paper, processed paper manufacturing 19. Publishing, printing, and related industries
20	Chemical products	
21	Inorganic chemistry etc.	201. Chemical fertilizer manufacturing 202. Inorganic chemical industrial product manufacturing
22	Organic chemistry, etc.	203. Organic chemical industrial product manufacturing
23	Chemical fibers	204. Chemical fiber manufacturing
24	Oil and fat processing, soap, etc.	205. Oil and fat processed product, soap, synthetic detergent, surface active agent, paint manufacturing
25	Medicine	206. Medicine manufacturing

[continued]

[Continuation of Table B]

Code	Technology classification [by industry]	JSIC [by industry]
26	Other chemical products	2091. Explosive manufacturing 2092. Agricultural chemical manufacturing 2093. Perfume manufacturing 2094. Cosmetics, toothpaste and other cosmetic preparation manufacturing 2095. Gelatine and adhesive manufacturing 2096. Photosensitive material manufacturing 2097. Natural resin product and wood chemical product manufacturing 2098. Chemical reagent manufacturing 2099. Manufacturing for other unclassified chemical industrial products
30	Petroleum and coal products	211. Petroleum refining 212. Lubricant and grease manufacturing (not through petroleum refining) 213. Coke manufacturing 241. Briquette and [small] oval briquette manufacturing 242. Paving material manufacturing 243. Manufacturing for other petroleum and coal products
31	Rubber products	23. Rubber product manufacturing
32	Tanned skin, leather products and fur	24. Manufacturing for tanned skin, leather products and fur
33	Ceramic industry	251. Glass and glass product manufacturing 252. Cement and cement product manufacturing 253. Manufacturing for clay products for construction (excluding porcelain products) 254. Porcelain and related product manufacturing 255. Fire-resistant product manufacturing 256. Carbon and graphite product manufacturing 257. Abrasive and related product manufacturing 258. Aggregate and stone product manufacturing 259. Manufacturing for other ceramic, clay and stone products

[continued]

[Continuation of Table B]

Code	Technology classification [by industry]	JSIC [by industry]
34	Iron and steel	261. Iron manufacturing using blast furnace 262. Iron manufacturing without using blast furnace 263. Steel manufacturing and steel rolling 264. Steel material manufacturing without manufacturing steel (excluding surface-treated steel materials) 265. Surface-treated steel manufacturing 266. Forged steel, forged product and cast steel manufacturing 267. Pig iron cast product manufacturing 268. Other iron and steel
35	Nonferrous metals	271. Nonferrous metal primary smelting and refining 272. Nonferrous metal secondary smelting and refining (including nonferrous alloy manufacturing) 273. Nonferrous metal and alloy rolling (including extraction and extrusion) 274. Nonferrous metal cast product manufacturing 275. Electric wire and cable manufacturing 276. Other nonferrous manufacturing
36	Metal products	281. Tin can and other coated sheet product manufacturing 282. Manufacturing for dining utensils, knives, hand tools and other hardware 283. Manufacturing for heating equipment, piping and accessories 284. Manufacturing for metal products for construction and buildings (including metal plates for drums) 285. Metal press product manufacturing 286. Powder metallurgy product manufacturing, cover and engraving, thermal processing (excluding enameled ironware) 287. Metal wire product manufacturing (excluding screws) 288. Manufacturing for bolts, nuts, rivets, small screws, wood screws, etc. 289. Other metal product manufacturing

[continued]



[Continuation of Table B]

Code	Technology classification [by industry]	JSIC [by industry]
40	General machinery and devices	
41	Boilers and motors	291. Boiler and motor manufacturing
42	Machinery for agriculture, construction, and mining	292. Agricultural machinery manufacturing (excluding farming tools) 293. Manufacturing for construction and mining machinery (including trucks for construction, agriculture, and transportation)
43	Metal processing machinery	294. Manufacturing for metal processing machinery
44	Textile machinery	295. Textile machinery manufacturing
45	Specialized industrial machinery	296. Manufacturing for specialized industrial machinery
46	General industrial machinery	
47	Pumps, compressors, and fans	2971. Pump and related equipment manufacturing 2972. Manufacturing for air compressors, gas compressors and fans
48	Power machinery	2973. Elevator and escalator manufacturing 2974. Load transport facility manufacturing 2975. Power transmission device manufacturing (excluding ball bearings and rolling bearings)
49	Chemical machinery and devices	2978. Manufacturing for chemical machinery and related equipment
50	Other general industrial machinery	2976. Industrial ceramic furnace manufacturing 2977. Manufacturing for hydraulic and air pressure equipment 2979. Manufacturing for other general industrial machinery and equipment

[continued]

[Continuation of Table B]

Code	Technology classification [by industry]	JSIC [by industry]
51	Other machinery	298. Manufacturing for office, service and consumer-oriented machinery and equipment 299. Manufacturing for other machinery and associated parts
52	Transportation machinery	311. Automobile and accessory manufacturing 312. Railway cars, accessory manufacturing 313. Bicycle and accessory manufacturing 314. Shipbuilding, repair, and marine engine manufacturing 315. Aircraft and accessory manufacturing 316. Manufacturing for other transportation machinery and equipment
53	Precision machinery	321. Manufacturing for gauges, measuring devices, analyzers and testing equipment 322. Survey equipment and tool manufacturing 323. Manufacturing for medical machinery, equipment and medical supplies 324. Manufacturing for physical science machinery and equipment 325. Manufacturing for optical machinery, tools and lenses 326. Eyeglass manufacturing (including frames) 327. Watch and accessory manufacturing
60	Electric machinery and devices	
61	Machinery for power generation, transmission, and electric machinery	301. Manufacturing for electric machinery and devices for power generation, transmission, distribution, and for industrial applications
62	Electric appliances, bulbs, and lighting equipment	302. Manufacturing for consumer electric appliances and devices 303. Manufacturing for bulbs and electric lighting equipment
63	Communications machinery	
64	Wire and wireless communications equipment	3041. Manufacturing for cable communications equipment 3042. Manufacturing for wireless communications equipment

[continued]

[Continuation of Table B]

Code	Technology classification [by industry]	JSIC [by industry]
65	Radio, TV, and audio equipment	3043. Manufacturing for radio receivers and television receivers 3044. Manufacturing for electric audio machinery and equipment
66	Other communications machinery	3045. Manufacturing for traffic signal security devices 3049. Manufacturing for other communications machinery, equipment, and related equipment
67	Equipment for electronic applications	
68	Computers	3051. Computer and accessory manufacturing
69	Other equipment for electronic applications	3061. X-ray equipment manufacturing 3062. Video equipment manufacturing 3069. Manufacturing for other electronic application equipment
70	Electronic and communications parts	308. Manufacturing for parts for electronic and communication equipment
71	Other electric machinery	307. Electric gauge manufacturing 309. Manufacturing for other electric machinery and equipment
80	Other products	
81	Precious metals, ornaments, etc.	341. Precious metal product manufacturing (including jewel processing) 345. Manufacturing for ornaments, decorations, buttons and related products (excluding precious metals and jewelry)
82	Recreational equipment	342. Musical instrument and recording manufacturing 343. Toy and sporting goods manufacturing

[continued]

[Continuation of Table B]

Code	Technology classification [by industry]	JSIC [by industry]
83	Plastic products	221. Manufacturing for plastic boards, rods, pipes, joints, and odd-shape extruded products 222. Manufacturing for plastic films, sheets, floor materials, and synthetic leather 223. Industrial plastic product manufacturing 224. Foaming and reinforcing plastic product manufacturing 225. Manufacturing for plastic molding materials (including used plastic) 229. Manufacturing for other plastic products
84	Manufacturing industry not classified otherwise	33. Weapons manufacturing 344. Manufacturing for pens, pencils, drawing supplies, and other office supplies 346. Lacquerware manufacturing 348-349. Manufacturing not classified otherwise
90	Other industries	G. Industry to provide electricity, gas, heat or potable water H. Transportation and communications industry I. Wholesaler, retailer, and restaurants J. Financing and insurance industry K. Real estate industry L. Service industry N. Official business (not included in other classification) M. Industries that cannot be classified

Table 2-1. Trends in Number of Imported Technology Contracts

Fiscal year	Type a	Type b	Total	Fiscal year	Type a	Type b	Total
1950	27	49	76	1971	1546	461	2007
1951	101	87	188	1972	1916	487	2403
1952	142	110	252	1973	1931	519	2450
1953	102	133	235	1974	1572	521	2093
1954	82	131	213	1975	1403	433	1836
1955	71	113	184	1976	1461	432	1893
1956	143	167	310	1977	1527	387	1914
1957	118	136	254	1978	1755	384	2139
1958	90	152	242	1979	1700	416	2116
1959	153	225	378	1980	1860	282	2142
1960	327	261	588	1981			2076
1961	320	281	601	1982			2229
1962	328	429	757	1983			2212
1963	564	573	1137	1984			2378
1964	500	541	1041	1985			2436
1965	472	486	958	1986			2361
1966	601	552	1153	1987			2709
1967	638	657	1295	1988			2834
1968	1061	683	1744	1989			2898
1969	1154	475	1629	1990			3211
1970	1330	438	1768				

(Note) The distinction of Types (a) and (b) was abolished in December 1980.

Table 2-2. Trends in Number of Contracts According to Country

Country		FY 1990	FY89	FY88	FY87	FY86
Asia	China	5	6	6	9	8
	India	1	4	0	0	0
	Indonesia	4	1	1	1	0
	Israel	2	1	2	1	4
	Japan	0	1	1	4	4
	Republic of Korea	16	14	23	17	1
	Singapore	40	47	30	21	32
	Hong Kong	6	17	20	11	14
	Taiwan	8	3	1	3	0
	Thailand	0	0	0	1	0
	Macao	0	1	0	0	0
Oceania	Australia	14	22	21	12	11
	New Zealand	4	1	3	1	0
Africa	Liberia	0	0	1	1	0
	South Africa	0	0	1	1	1
Europe	EC	0	0	0	1	0
	Austria	9	6	11	9	12
	Belgium	22	22	9	11	10
	Czechoslovakia	0	0	0	1	0
	Denmark	11	15	20	7	21
	Finland	4	3	2	4	7
	France	158	187	237	218	212
	Germany	201	198	187	192	182
	Greece	0	0	1	0	0
	Hungary	2	1	3	1	3
	Ireland	4	1	4	4	2
	Italy	60	78	81	115	109
	Liechtenstein	2	0	2	2	3
	Luxembourg	1	1	1	5	0
	Monaco	0	1	1	1	1
	The Netherlands	86	79	72	71	60
	Norway	9	6	8	6	4
	Poland	2	0	1	1	0
	Portugal	0	0	0	0	1
	Spain	5	5	3	3	2
	Sweden	30	30	31	41	28
	Switzerland	108	81	77	66	84
	The United Kingdom	185	196	193	184	149
	The Channel Islands	1	0	0	1	0
	Gibraltar	0	1	0	0	0
Soviet Union		2	2	11	11	4

[Continuation of Table 2-2]

Country		FY 1990	FY89	FY88	FY87	FY86
North America	Bahamas	1	0	0	0	1
	Canada	83	48	45	36	26
	Mexico	0	0	1	0	0
	Panama	3	10	12	16	8
	United States	2119	1808	1705	1613	1354
	Bermuda	1	0	0	1	0
	Cayman Islands	0	0	0	2	0
	Puerto Rico	1	0	0	0	0
	British Virgin Islands	0	0	0	0	2
	Barbados	0	1	0	0	0
South America	Argentina	0	0	2	1	0
	Bolivia	1	0	0	0	0
	Brazil	1	0	1	2	0
	Paraguay	0	0	2	0	0
	Venezuela	0	0	0	0	1
	Uruguay	0	1	1	0	0
	Chile	1	0	0	0	0
Total		3211	2898	2834	2709	2361

(Note) The figure for Germany includes contracts with East Germany before unification.

Table 2-3. Number of Contracts [signed] in FY90 According to Technology Classification and Region

Technology classification [by industry]	Region	Total No.	Asia	Oceania	Europe					
	Code				Total No.	France	Ger- many	Italy	UK	Others
All industries	1	3211	82	18	898	158	201	60	185	294
Agriculture, forestry, and fishery	2	5		1	1				1	
Mining	3	1								
Construction	4	18		1	10	1	1		1	7
Manufacturing	5	3169	82	16	884	156	199	59	183	287
Food and tobacco	11	32	1		18	6	2		3	7
Textile	12	32			27	13		5	5	4
Clothing and textile products	13	159	3	1	117	44	2	21	20	30
Outer garments	14	106	2	1	82	31	2	15	13	21
Other clothing and textile products	15	53	1		35	13		6	7	9
Lumber, wood prod- ucts, furniture, etc.	16	13			9		5	2	2	
Pulp, paper products and printing	17	10			4		3		1	
Chemical products	20	207	3	1	75	5	23	7	13	27
Inorganic chemistry, etc.	21	6			1		1			
Organic chemistry, etc.	22	38			14		10	1	2	1
Chemical fibers	23	6			4		1			3
Oil, fat processing, soap, etc.	24	15			7		3		3	1
Medicine	25	103	1	1	37	3	5	6	6	17
Other chemical products	28	39	2		12	2	3		2	5
Petroleum and coal products	30	11			4				2	2
Rubber products	31	9			4	1		1	1	1
Tanned skin, leather products, and fur	32	48	1		30	12		5	1	12
Ceramics	33	36	1		21	6	6		6	3
Iron and steel	34	7			3		1			2
Nonferrous metals	35	19			12	2	5		3	2
Metal products	36	44		2	21	2	7		1	11



[Continuation of Table 2-3]

Technology classification [by industry]	Region		Total No.	Asia	Oceania	Europe				
	Code					Total No.	France	Ger- many	Italy	UK
General machinery and devices	40	295	2	2	108	7	44	5	14	38
Boilers and motors	41	64	1		13	4	6		1	2
Machinery for agri- culture, construc- tion and mining	42	7		2	3		1			2
Metal processing machinery	43	32	1		14	1	9		2	2
Textile machinery	44	5			5		1	1	2	1
Specialized indus- trial machinery	45	44			16		7	1	1	7
General industrial machinery	46	115			52	2	16	3	8	23
Pumps, compressors and fans	47	8			2		2			
Power machinery	48	19			10		4	2	1	3
Chemical machinery and devices	49	74			36	2	8		7	19
Other general in- dustrial machinery	50	14			4		2	1		1
Other machinery	51	28			5		4			1
Transportation machinery	52	80		2	45	2	21	5	6	11
Precision machinery	53	66	1		31	10	8	2	3	8
Electric machinery and devices	60	1972	68	8	292	32	58	2	92	108
Machinery for power generation, transmis- sion, electric machin.	61	20			12	2	9			1
Electric appliances, bulbs, and lighting equipment	62	13	1		2		1			1
Communications machinery	63	148		2	44	2	12		6	24
Wire and wireless communications machinery	64	53		2	9		1		5	3
Radio, TV, audio equipment	65	95			35	2	11		1	21
Other communica- tions equipment	66									
Equipment for elec- tronic applications	67	1656	63	6	212	27	32	2	83	68
Computers	68	1588	62	6	201	26	28	1	80	66

[Continuation of Table 2-3]

Technology classification [by industry]	Region		Total No.	Asia	Oceania	Europe					
	Code					Total No.	France	Ger- many	Italy	UK	Others
Other equipment for electronic applications	69	68	1		11	1	4	1	3	2	
Electronic and com- munications parts	70	122	4		21	1	4		3	13	
Other electric machinery	71	13			1					1	
Other products	80	129	2		83	14	14	4	10	21	
Precious metals, ornaments, etc.	81	15			14	5	1	1		7	
Recreational equipment	82	40			8	1		2	1	2	
Plastic products	83	38	1		24	5	8	1	6	4	
Manufacturing indus- try not classified otherwise	84	36	1		19	3	5		3	8	
Other industries	90	18			3	1	1	1			

Table 2-3. Number of Contracts [signed] in FY90 According to Technology Classification and Region (Continued)

Region Technology classification (by industry)	Code	Total No.	Soviet Union	North America				South America
				Total No.	U.S.	Can- ada	Others	
All industries	1	3211	2	2208	2119	83	6	3
Agriculture, forestry and fishing	2	5		3	3			
Mining	3	1		1			1	
Construction	4	18		7	6	1		
Manufacturing	5	3169	2	2182	2095	82	5	3
Food and tobacco	11	32		13	12		1	
Textile	12	32		5	5			
Clothing and textile products	13	159		37	34	2	1	1
Outer garments	14	106		20	18	2		1
Other clothing and textile products	15	53		17	16		1	
Lumber, wood products, furniture, etc.	16	13		4	4			
Pulp, paper products, and printing	17	10		6	5	1		
Chemical products	20	207	1	127	123	4		
Inorganic chemistry, etc.	21	6		5	5			
Organic chemistry, etc.	22	38		24	23	1		
Chemical fibers	23	6		2	2			
Oil, fat processing, soap, etc.	24	15		8	8			
Medicine	25	103		64	62	2		
Other chemical products	26	39	1	24	23	1		
Petroleum and coal products	30	11		7	7			
Rubber products	31	9		5	5			
Tanned skin, leather products, and fur	32	48		17	16	1		
Ceramics	33	36		14	14			
Iron and steel	34	7		4	4			
Nonferrous metals	35	19		7	6	1		
Metal products	36	44	1	20	18	2		

[Continuation of Table 2-3]

Region Technology classification (by industry)	Code	Total No.	Soviet Union	North America			South America
				Total No.	U.S.	Can- ada	Others
General machinery and devices	40	295		182	179	3	1
Boilers and motors	41	64		50	49	1	
Machinery for agriculture, construction and mining	42	7		2	2		
Metal processing machinery	43	32		17	17		
Textile machinery	44	5					
Specialized industrial machinery	45	44		28	28		
General industrial machinery	46	115		63	63		
Pumps, compressors, and fans	47	8		6	6		
Power machinery	48	19		9	9		
Chemical machinery and devices	49	74		38	38		
Other general industrial machinery	50	14		10	10		
Other machinery	51	28		22	20	2	1
Transportation machinery	52	80		32	30	2	1
Precision machinery	53	66		34	31	2	1
Electric machinery and devices	60	1972		1604	1541	62	1
Machinery for power generation, transmission, and electric machinery for industry	61	20		8	7	1	
Electric appliances, bulbs, and lighting equipment	62	13		10	10		
Communications machinery	63	148		102	101	1	
Wire and wireless communica- tions machinery	64	53		42	41	1	
Radio, TV, and audio equipment	65	95		60	60		
Other communications equipment	68						
Equipment for electronic applications	67	1656		1375	1320	54	1
Computers	68	1588		1319	1284	54	1

[Continuation of Table 2-3]

Region Technology classification (by industry)	Code	Total No.	Soviet Union	North America			South America
				Total No.	U.S.	Can- ada	Others
Other equipment for electronic applications	69	68		56	56		
Electronic and communications parts	70	122		97	92	5	
Other electric machinery	71	13		12	11	1	
Other products	80	129		64	61	2	1
Precious metals, ornaments, etc.	81	15		1	1		
Recreational equipment	82	40		34	32	1	1
Plastic products	83	38		13	12	1	
Manufacturing industry not classified otherwise	84	36		16	16		
Other industries	90	18		15	15		

Table 2-4. Trends in Technologies Imported in FY90 According to Technology Classification

Technology classification [by industry]	Total No. [of con- tracts]	Type of imported technology				
		Trade mark only	Patent only	Know- how only	Patent + know- how	Pending patents
All industries	3211	407	248	1988	461	89
Agriculture, forestry and fishing	5	1		3	1	1
Mining	1				1	
Construction	18			15	3	
Manufacturing	3169	403	248	1957	455	87
Food and tobacco	32	24		3		
Textile	32	30				
Clothing and textile products	159	156				
Outer garments	106	103				
Other clothing and textile products	53	53				
Lumber, wood products, furniture, etc.	13	3		7	1	
Pulp, paper products, and printing	10	5		1	2	2
Chemical products	207	19	23	58	91	31
Inorganic chemistry, etc.	6	1	1	2	1	
Organic chemistry, etc.	38	1	2	11	23	7
Chemical fibers	6	1	1	1	1	1
Oil, fat processing, soap, etc.	15	6	1	5	2	
Medicine	103	4	8	28	60	21
Other chemical products	39	6	10	11	4	2
Petroleum and coal products	11			5	6	1
Rubber products	9	3		4	2	1
Tanned skin, leather products, and fur	48	45			1	
Ceramics	36	5	4	13	12	1
Iron and steel	7			4	3	1
Nonferrous metals	19		2	13	3	
Metal products	44	4	2	10	24	5

[Continuation of Table 2-4]

Technology classification [by industry]	Total No. [of con- tracts]	Type of imported technology				
		Trade- mark only	Patent only	Know- how only	Patent + know- how	Pending patents
General machinery and devices	295	7	26	155	89	25
Boilers and motors	64		2	59	2	2
Machinery for agriculture, construction and mining	7			2	3	2
Metal processing machinery	32		6	10	12	3
Textile machinery	5		1	1	3	2
Specialized industrial machinery	44	3	5	16	18	4
General industrial machinery	115	3	4	62	39	10
Pumps, compressors, and fans	8			2	3	
Power machinery	19	2		7	9	1
Chemical machinery and devices	74	1	2	46	23	8
Other general industrial machinery	14		2	7	4	1
Other machinery	28	1	8	5	12	2
Transportation machinery	80	7	20	29	22	3
Precision machinery	66	22	8	13	20	5
Electric machinery and devices	1972	11	160	1811	150	6
Machinery for power generation, transmission, and electric machinery for industry	20	1	4	3	12	1
Electric appliances, bulbs, and lighting equipment	13	1	2	2	8	
Communications machinery	148	3	68	19	38	
Wire and wireless communica- tions machinery	53	1	23	14	13	
Radio, TV, and audio equipment	95	2	45	5	25	
Other communications equipment						
Equipment for electronic applications	1656	6	53	1533	47	1
Computers	1588	5	20	1513	35	1

[Continuation of Table 2-4]

Technology classification [by industry]	Total No. [of con- tracts]	Type of imported technology				
		Trade mark only	Patent only	Know- how only	Patent + know- how	Pending patents
Other equipment for electronic applications	68	1	33	20	12	
Electronic and communications parts	122		30	51	38	3
Other electric machinery	13		3	3	7	1
Other products	129	62	3	31	29	6
Precious metals, ornaments, etc	15	13			2	
Recreational equipment	40	28	1	5	4	
Plastic products	38	3	1	15	17	5
Manufacturing industry not classified otherwise	36	18	1	11	6	1
Other industries	18	3		13	1	1



Table 2-4. Trends in Technologies Imported in FY90 According to Technology Classification (Continued)

Technology classification [by industry]	Total No. [of con- tracts]	Type of imported technology				Unin- dustri- alized tech- nology
		Patent + trade- mark	Trade mark + know- how	Patent + trademark + know- how	Pending patents	
All industries	3211	7	42	58	7	1840
Agriculture, forestry and fishing	5					
Mining	1					
Construction	18					8
Manufacturing	3169	7	41	58	7	1818
Food and tobacco	32		3	2		16
Textile	32		1	1		17
Clothing and textile products	159		3			77
Outer garments	106		3			45
Other clothing and textile products	53					32
Lumber, wood products, furniture, etc.	13		1	1		1
Pulp, paper products, and printing	10	1	1			4
Chemical products	207		6	10	2	83
Inorganic chemistry, etc.	6			1		
Organic chemistry, etc.	38			1		17
Chemical fibers	6			2		1
Oil, fat processing, soap, etc.	15		1			4
Medicine	103			3	2	49
Other chemical products	39		5	3		12
Petroleum and coal products	11					6
Rubber products	9					3
Tanned skin, leather products, and fur	48		2			25
Ceramics	36		1	1		10
Iron and steel	7					2
Nonferrous metals	19			1		8
Metal products	44	1		3	1	10

[Continuation of Table 2-4]

Technology classification [by industry]	Total No. [of con- tracts]	Type of imported technology				Unin- dustri- alized tech- nology
		Patent + trade- mark	Trade- mark + know- how	Patent + trademark + know- how	Pending patents	
General machinery and devices	295		5	13		99
Boilers and motors	64			1		57
Machinery for agriculture, construction and mining	7			2		1
Metal processing machinery	32		4			3
Textile machinery	5					3
Specialized industrial machinery	44			2		9
General industrial machinery	115		1	6		20
Pumps, compressors, and fans	8			3		3
Power machinery	19			1		5
Chemical machinery and devices	74		1	1		10
Other general industrial machinery	14			1		2
Other machinery	28			2		6
Transportation machinery	80		1	1	1	14
Precision machinery	66		2	1		32
Electric machinery and devices	1972	3	14	23	3	1353
Machinery for power generation, transmission, and electric machinery for industry	20					2
Electric appliances, bulbs, and lighting equipment	13					5
Communications machinery	148	3	5	12	2	74
Wire and wireless communica- tions machinery	53			2		24
Radio, TV, and audio equipment	95	3	5	10	2	50
Other communications equipment						
Equipment for electronic applications	1658		8	9	1	1225
Computers	1588		8	7	1	1183

[Continuation of Table 2-4]

Technology classification [by industry]	Total No. [of con- tracts]	Type of imported technology				Unin- dustri- alized tech- nology
		Patent + trade- mark	Trade- mark + know- how	Patent + trademark + know- how	Pending patents	
Other equipment for electronic applications	68			2		42
Electronic and communications parts	122		1	2		43
Other electric machinery	13					4
Other products	129	2	1	1		58
Precious metals, ornaments, etc	15					13
Recreational equipment	40	1	1			22
Plastic products	38	1		1		7
Manufacturing industry not classified otherwise	36					16
Other industries	18		1			14

Table 2-5. Contract Conditions (Royalties) in FY90 According to Technology Classification

Technology classification [by industry]	Total No. of contracts	Royalty									
		Gratis	With compensation	With initial payment	Running royalty						With minimum payment
					Less than 2%	Less than 5%	Less than 8%	8% or more	Others	Total	
All industries	3211	182	3029	2214	88	306	284	160	856	1674	396
Agricultural, forestry, and fishery	5		5	3		2	1		2	5	1
Mining	1		1	1					1	1	1
Construction	18		18	12		5		1	7	13	2
Manufacturing	3169	181	2988	2181	87	295	281	159	844	1648	390
Food and tobacco	32	7	25	9	1	11	4	1	4	21	8
Textile	32		32	4	1	8	16	2	3	30	25
Clothing and textile products	159	7	152	33	9	32	54	21	12	128	99
Outer garments	106	4	102	30	5	20	34	12	9	80	55
Other clothing and textile products	53	3	50	3	4	12	20	9	3	48	44
Lumber, wood products, furniture, etc.	13		13	6	3	3	3	1	3	13	5
Pulp, paper products, and printing	10		10	3		3	1	2	2	8	1
Chemical products	207	28	179	131	12	40	34	13	33	132	29
Inorganic chemistry, etc.	6	1	5	3				1	2	3	
Organic chemistry, etc.	38	5	33	29	2	2	3		15	22	2
Chemical fibers	6	2	4	3		2			1	3	
Oil and fat processing, soap, etc.	15	3	12	5	1	6	3	1		11	8
Medicine	103	13	90	67	7	19	21	10	11	68	16
Other chemical products	39	4	35	24	2	11	7	1	4	25	5
Petroleum and coal products	11		11	9					7	7	

[Continuation of Table 2-5]

Technology classification [by industry]	Total No. [of con- tracts]	Royalty									
		Gratis	With com- pen- sation	With ini- tial pay- ment	Running royalty						With mini- mum pay- ment
					Less than 2%	Less than 5%	Less than 8%	8% or more	Others	Total	
Rubber products	9		9	5		2	4			6	2
Tanned skin, leather products, and fur	48		48	6	1	10	19	9	5	44	35
Ceramics	36	2	34	22	5	1	2	4	12	24	7
Iron and steel	7		7	5	2				3	5	
Nonferrous metals	19	3	16	14		2			5	7	1
Metal products	44	4	40	29	2	16	7	2	4	31	11
General machinery and devices	295	14	281	222	6	49	32	11	59	157	27
Boilers and motors	64	4	60	58		2	1		4	7	
Machinery for agricul- ture, construction and mining	7		7	4			1	2	2	5	2
Metal processing machinery	32	2	30	20	1	8	7	1	3	20	2
Textile machinery	5		5	5		3	1			4	2
Specialized indus- trial machinery	44	2	42	27	2	8	5	3	17	35	6
General industrial machinery	115	5	110	85	2	22	14	4	28	68	10
Pumps, compressors, and fans	8		8	2		3	3			6	
Power machinery	19	3	16	12	1	4	3		4	12	1
Chemical machinery and devices	74	2	72	58	1	11	8	4	16	40	8
Other general in- dustrial machinery	14		14	13		4			6	10	1

[Continuation of Table 2-5]

Technology classification [by industry]	Total No. [of contracts]	Royalty									
		Gratis	With compensation	With initial payment	Running royalty						With minimum payment
					Less than 2%	Less than 5%	Less than 8%	8% or more	Others	Total	
Other machinery	28	1	27	23	1	6	3	1	7	18	5
Transportation machinery	80		80	66	2	19	9	6	13	49	7
Precision machinery	68	3	63	35	2	8	18	7	11	46	25
Electric machinery and devices	1972	102	1870	1523	35	68	20	61	661	845	65
Machinery for power generation, transmission, and electric machinery for industry	20		20	16	4	2	2	1	5	14	3
Electric appliances, bulbs, and lighting equipment	13	2	11	9	1	3			2	6	1
Communications machinery	148	11	137	114	1	6		1	72	80	4
Wire and wireless communications machinery	53	4	49	41		3		1	17	21	1
Radio, television, and audio equipment	95	7	88	73	1	3			55	59	3
Other communications machinery											
Equipment for electronic applications	1856	73	1583	1284	11	30	9	57	558	665	54
Computers	1588	71	1517	1227	5	20	6	58	534	621	52
Other equipment for electronic applications	68	2	66	57	6	10	3	1	24	44	2
Electronic and communications parts	122	14	108	93	18	21	8	2	23	72	3
Other electric machinery	13	2	11	7		6	1		1	8	

[Continuation of Table 2-5]

Technology classification [by industry]	Total No. [of con- tracts]	Royalty									
		Gratis	With com- pen- sation	With ini- tial pay- ment	Running royalty						With mini- mum pay- ment
					Less than 2%	Less than 5%	Less than 8%	8% or more	Others	Total	
Other products	129	11	118	59	6	23	38	19	7	93	43
Precious metals, ornaments, etc.	15	1	14	5	1	2	7	3		13	10
Recreational equipment	40	6	34	10		6	9	9	4	28	13
Plastic products	38	2	36	28	4	14	4	1		23	5
Manufacturing industry not classified otherwise	36	2	34	18	1	1	18	6	3	29	15
Other industries	18	1	17	17	1	4	2		2	9	2

Table 2-6. Compensation Conditions in FY90 According to Technology Classification

Technology classification [by industry]	Code	Total No. of con- tracts	Initial payment only	Initial payment + running royalty	Running royalty only	Running royalty + minimum payment	Initial payment + running royalty + minimum payment
All industries	1	3211	1355	737	541	274	122
Agricultural, forestry and fishing	2	5		2	2		1
Mining	3	1					1
Construction	4	18	5	6	5	1	1
Manufacturing	5	3169	1342	722	534	273	117
Food and tobacco	11	32	4	5	8	8	
Textile	12	32	2	1	4	24	1
Clothing and textile products	13	159	24	3	26	93	6
Outer garments	14	106	22	3	22	50	5
Other clothing and textile products	15	53	2		4	43	1
Lumber, wood products, furniture, etc.	16	13		4	4	3	2
Pulp, paper products, and printing	17	10	2		7		1
Chemical products	20	207	47	63	40	8	21
Inorganic chemistry, etc.	21	6	2	1	2		
Organic chemistry, etc.	22	38	11	16	4		2
Chemical fibers	23	6	1	2	1		
Oil and fat process- ing, soap, etc.	24	15	1	1	4	3	3
Medicine	25	103	22	31	21	2	14
Other chemical products	26	39	10	12	8	3	2
Petroleum and coal products	30	11	4	5	2		
Rubber products	31	9	3	1	3	1	1
Tanned skin, leather products and fur	32	48	4	1	8	34	1
Ceramics	33	36	10	9	8	4	3



[Continuation of Table 2-6]

Technology classification [by industry]	Code	Total No. of contracts	Initial payment only	Initial payment + running royalty	Running royalty only	Running royalty + minimum payment	Initial payment + running royalty + minimum payment
Iron and steel	34	7	2	3	2		
Nonferrous metals	35	19	9	4	2		1
Metal products	36	44	9	12	8	3	8
General machinery and devices	40	295	124	78	52	7	20
Boilers and motors	41	64	53	5	2		
Machinery for agri- culture, construction, and mining	42	7	2	1	2	1	1
Metal processing machinery	43	32	10	8	10		2
Textile machinery	44	5	1	2			2
Specialized indus- trial machinery	45	44	7	16	13	2	4
General industrial machinery	46	115	42	37	21	4	6
Pumps, compressors, and fans	47	8	2		6		
Power machinery	48	19	4	7	4		1
Chemical machinery and devices	49	74	32	21	11	3	5
Other general indus- trial machinery	50	14	4	9		1	
Other machinery	51	28	9	9	4		5
Transportation machinery	52	80	31	31	11	3	4
Precision machinery	53	66	17	14	7	21	4
Electric machinery and devices	60	1972	1025	461	319	28	37
Machinery for power generation, transmis- sion, and electric machinery for industry	61	20	6	7	4		3
Electric appliances, bulbs, and lighting equipment	62	13	5	3	2		1

[Continuation of Table 2-6]

Technology classification [by industry]	Code	Total No. of con- tracts	Initial payment only	Initial payment + running royalty	Running royalty only	Running royalty + minimum payment	Initial payment + running royalty + minimum payment
Communications machinery	63	148	57	53	23		4
Wire and wireless communications machinery	64	53	28	12	8		1
Radio, television, and audio equipment	65	95	29	41	15		3
Other communications machinery	66						
Equipment for elec- tronic applications	67	1658	918	340	271	28	26
Computers	68	1588	896	308	263	27	25
Other equipment for electronic applica- tions	69	68	22	34	8	1	1
Electronic and com- munication parts	70	122	36	54	15		3
Other electric machinery	71	13	3	4	4		
Other products	80	129	25	27	23	36	7
Precious metals, ornaments, etc.	81	15	1	2	1	8	2
Recreational equipment	82	40	6	4	11	13	
Plastic products	83	38	13	9	9	1	4
Manufacturing industry not classified otherwise	84	36	5	12	2	14	1
Other industries	90	18	8	7			2

Table 2-7. Contract Conditions (Contract period) in FY90 According to Technology Classification

Technology classification [by industry]	Total No. of con- tracts	Contract period						
		Less than 1 yr	Less than 5 yrs	Less than 10 yrs	Less than 15 yrs	15 yrs or more	Until patent expires	Others
All industries	3211	144	811	367	213	72	289	1315
Agriculture, forestry, and fishery	5		1	1				3
Mining	1							1
Construction	18	1	3	8	4		1	1
Manufacturing	3169	140	805	357	207	89	288	1303
Food and tobacco	32	1	12	7	3		1	8
Textile	32	5	22	3		1	1	
Clothing and textile products	159	18	97	24	1	1	1	17
Outer garments	108	12	58	20	1		1	14
Other clothing and textile products	53	6	39	4		1		3
Lumber, wood products, furniture, etc.	13	1	5	6		1		
Pulp, paper products, and printing	10		5	1		1	1	2
Chemical products	207	10	32	17	21	20	47	60
Inorganic chemistry, etc.	6		1		1	2		2
Organic chemistry, etc.	38	3	2	3	3	8	5	14
Chemical fibers	6						2	4
Oil, fat processing, soap, etc.	15		5	3	3		2	2
Medicine	103	6	15	4	10	8	28	32
Other chemical products	39	1	9	7	4	2	10	6
Petroleum and coal products	11		1		1	1		8
Rubber products	9		3		2		1	3
Tanned skin, leather products, and fur	48		37	6	1			4
Ceramics	36	1	7	10	4	2	7	5
Iron and steel	7		1	1	3	1	1	
Nonferrous metals	19		4	1	2	1	2	9
Metal products	44		6	12	8	2	5	11

[Continuation of Table 2-7]

Technology classification [by industry]	Total No. of con- tracts	Contract period						
		Less than 1 yr	Less than 5 yrs	Less than 10 yrs	Less than 15 yrs	15 yrs or more	Until patent expires	Others
General machinery and devices	295	25	75	65	48	8	24	50
Boilers and motors	64	17	31	4	2			10
Machinery for agriculture, construction and mining	7	1	2	1	2			1
Metal processing machinery	32	2	5	13	6		5	1
Textile machinery	5			2		1	1	1
	44		12	14	4	1	7	6
General industrial machinery	115	3	21	27	30	3	4	27
Pumps, compressors, and	8		2	3				3
Power machinery	19	1	3	3	9	1	2	
Chemical machinery and	74	2	13	16	17	1	2	23
Other general industrial machinery	14		3	5	4	1		1
Other machinery	28	2	4	4	4	3	7	4
Transportation machinery	80	5	11	13	18	6	18	9
Precision machinery	66	3	23	5	6	1	16	12
Electric machinery and devices	1972	67	413	167	79	13	154	1079
Machinery for power genera- tion, transmission, and electric machinery for indus.	20	1	1	5	5	1	4	3
Electric appliances, bulbs, and lighting equipment	13	1	4	3	2	1	1	1
Communications machinery	148	6	28	10	21	2	61	20
Wire and wireless communica- tions machinery	53		7	1	3		28	14
Radio, TV, and audio	95	8	21	9	18	2	33	6
Other communications machinery								
Equipment for electronic applications	1656	58	361	122	34	8	52	1021
Computers	1588	53	340	112	32	7	32	1012
Other equipment for elec- tronic applications	68	5	21	10	2	1	20	9

[Continuation of Table 2-7]

Technology classification [by industry]	Total No. of con- tracts	Contract period						
		Less than 1 yr	Less than 5 yrs	Less than 10 yrs	Less than 15 yrs	15 yrs or more	Until patent expires	Others
Electronic and communi- cations parts	122	1	16	25	17		32	31
Other electric machinery	13		3	2		1	4	3
Other products	129	4	51	19	10	10	9	26
Precision metals, ornaments, etc.	15		9	4				2
Recreational equipment	40	1	23	5			1	10
Plastic products	38	2	7	6	5	3	7	8
Manufacturing industry not classified otherwise	36	1	12	4	5	7	1	6
Other industries	18	3	2	1	2	3		7

Table 2-8. Contract Conditions (Regions in which sales are permitted) in FY90  
According to Technology Classification

Technology classification [by industry]	Total No. of con- tracts	Regions in which sales are permitted					
		Japan only	Incl. Korea, Taiwan	Incl. Asia	Incl. Europe Amer- ica	World- wide	Others
All industries	3211	1964	40	128	4	879	196
Agriculture, forestry and fishing	5	2		1		2	
Mining	1	1					
Construction	18	14	1	1		1	1
Manufacturing	3169	1929	39	128	4	876	195
Food and tobacco	32	28		2		1	1
Textile	32	25		5		1	1
Clothing and textile products	159	133	5	15	1	1	4
Outer garments	106	82	5	15	1	1	2
Other clothing and textile products	53	51					2
Lumber, wood products, furniture, etc.	13	11		1		1	
Pulp, paper products, and printing	10	8		1		1	
Chemical products	207	103	12	13		57	22
Inorganic chemistry, etc.	6	1		1		3	1
Organic chemistry, etc.	38	15		1		17	5
Chemical fibers	6	1		3		2	
Oil, fat processing, soap, etc.	15	11	2	1		1	
Medicine	103	51	6	6		27	13
Other chemical products	39	24	4	1		7	3
Petroleum and coal products	11	8				2	1
Rubber products	9	5	1	2		1	
Tanned skin, leather products, and fur	48	42		2			4
Ceramics	38	17		2		12	5
Iron and steel	7	2				4	1
Nonferrous metals	19	8		1		6	4
Metal products	44	24		3		12	5

[Continuation of Table 2-8]

Technology classification [by industry]	Total No. of con- tracts	Regions in which sales are permitted					
		Japan only	Incl. Korea, Taiwan	Incl. Asia	Incl. Europe Amer- ica	World- wide	Others
General machinery and devices	295	149	13	46		45	42
Boilers and motors	64	57		3		3	1
Machinery for agriculture, construction and mining	7	3		3		1	
Metal processing machinery	32	12	1	5		3	11
Textile machinery	5	1		1		2	1
Specialized industrial machinery	44	17	3	8		12	4
General industrial machinery	115	49	9	23		13	21
Pumps, compressors, and fans	8	2	1	3		2	
Power machinery	19	5	3	2		5	4
Chemical machinery and devices	74	36	4	16		4	14
Other general industrial machinery	14	6	1	2		2	3
Other machinery	28	10		3		11	4
Transportation machinery	80	36	1	4		25	14
Precision machinery	66	31	1	6		20	8
Electric machinery and devices	1972	1203	5	17	3	672	72
Machinery for power generation, transmission, and electric machinery for industry	20	9		1		6	4
Electric appliances, bulbs, and lighting equipment	13	3				6	4
Communications machinery	148	18		1		115	14
Wire and wireless communica- tions machinery	53	9		1		35	8
Radio, TV, and audio equipment	95	9				80	6
Other communications equipment							
Equipment for electronic applications	1658	1154	5	11	3	442	41
Computers	1588	1145	5	7	1	397	33
Other equipment for electronics applications	68	9		4	2	45	8
Electronic and communications parts	122	17		3		93	9
Other electric machinery	13	2		1		10	

[Continuation of Table 2-8]

Technology classification [by industry]	Total No. of con- tracts	Regions in which sales are permitted					
		Japan only	Incl. Korea, Taiwan	Incl. Asia	Incl. Europe Amer- ica	World- wide	Others
Other products	129	96	1	6		15	11
Precious metals, ornaments, etc	15	10		2		2	1
Recreational equipment	40	29	1			6	4
Plastic products	38	25		2		6	5
Manufacturing industry not classified otherwise	36	32		2		1	1
Other industries	18	18					



Table 2-9. Contract Conditions (Capital funds) in FY90 According to Technology Classification

Technology classification [by industry]	Total No. of con- tracts	Capital funds								
		Less than ¥50 mil.	Less than ¥100 mil.	Less than ¥500 mil.	Less than ¥1 bil.	Less than ¥5 bil.	Less than ¥10 bil.	Less than ¥50 bil.	¥50 or more	Un- known
All industries	3211	296	248	518	74	357	172	542	985	19
Agricultural, forestry and fishing	5		1			1		1	2	
Mining	1							1		
Construction	18	2	1	3		3		4	5	
Manufacturing	3169	290	244	514	73	353	172	535	971	17
Food and tobacco	32	7	1	5	1	8		10		
Textile	32	10	1	3	2	2		9	5	
Clothing and textile products	159	41	18	16	5	25	6	28	22	
Outer garments	106	23	12	13	3	15	5	17	18	
Other clothing and textile products	53	18	6	3	2	10	1	9	4	
Lumber, wood products, furniture, etc.	13	2	1	7	1		1	1		
Pulp, paper products, and printing	10	3		2	1	2		2		
Chemical products	207	18	6	19	10	27	25	79	21	2
Inorganic chemistry, etc.	6	1		2		1		1	1	
Organic chemistry, etc.	38	2	2	3		6	5	10	10	
Chemical fibers	6	2			1			2	1	
Oil and fat process- ing, soap, etc.	15	4	3	2	1	2		3		
Medicine	103	4	1	8	2	18	17	47	5	1
Other chemical products	39	5		4	6		3	16	4	1
Petroleum and coal products	11					3	4	4		
Rubber products	9	1	1	1	3		1	2		
Tanned skin, leather products and fur	48	13	7	5		10		8	5	
Ceramics	36	3	1	4		2	5	13	8	

[Continuation of Table 2-9]

Technology classification [by industry]	Total No. of con- tracts	Capital funds								
		Less than ¥50 mil.	Less than ¥100 mil.	Less than ¥500 mil.	Less than ¥1 bil.	Less than ¥5 bil.	Less than ¥10 bil.	Less than ¥50 bil.	¥50 or more	Un- known
Iron and steel	7			1				1	5	
Nonferrous metals	19			2		1		5	11	
Metal products	44	8	3	12		1	4	10	5	1
General machinery and devices	296	28	24	20	9	28	20	61	103	2
Boilers and motors	64	1				7		3	53	
Machinery for agri- culture, construction, and mining	7	3	1			3				
Metal processing machinery	32	5	2	4	2	2	6	7	4	
Textile machinery	5	1		1	2		1			
Specialized indus- trial machinery	44	5	2	7		4	3	7	15	1
General industrial machinery	115	11	18	5	3	9	9	35	24	1
Pumps, compressors, and fans	8	1	2			1		3	1	
Power machinery	19	3	3	4		1		3	5	
Chemical machinery and devices	74	6	11		3	6	9	24	14	1
Other general indus- trial machinery	14	1	2	1		1		5	4	
Other machinery	28	2	1	3	2	3	1	9	7	
Transportation machinery	80	5	2	7		8	7	21	30	
Precision machinery	66	7	6	9		9	1	20	14	
Electric machinery and devices	1972	117	163	384	40	208	88	238	722	12
Machinery for power generation, transmis- sion, and electric machinery for industry	20	1	1	1	2	4	1	3	7	
Electric appliances, bulbs, and lighting equipment	13	1	2	1			4	2	3	

[Continuation of Table 2-9]

Technology classification [by industry]	Total No. of con- tracts	Capital funds								
		Less than ¥50 mil.	Less than ¥100 mil.	Less than ¥500 mil.	Less than ¥1 bil.	Less than ¥5 bil.	Less than ¥10 bil.	Less than ¥50 bil.	¥50 or more	Un- known
Communications machinery	148	9	6	8	3	12	9	35	68	
Wire and wireless communications machinery	53	1		1	3	2	2	10	34	
Radio, television, and audio equipment	95	8	6	7		10	7	25	32	
Other communications machinery										
Equipment for electronic applications	1656	106	154	369	34	180	66	176	559	12
Computers	1588	104	154	366	34	174	61	166	517	12
Other equipment for electronic applications	88	2		3		6	5	10	42	
Electronic and communication parts	122			4	1	11	8	17	81	
Other electric machinery	13			1		1		5	6	
Other products	129	27	10	17	1	19	10	25	20	
Precious metals, ornaments, etc.	15	4	2	4		3	1		1	
Recreational equipment	40	12	2	6		8	2	8	2	
Plastic products	38	3	2	4	1	4	3	12	9	
Manufacturing industry not classified otherwise	36	8	4	3		4	4	5	8	
Other industries	18	4	2	1	1			1	7	2

Table 2-10. Contract Conditions (Exclusive rights, license resale rights, cross licensing, stock ownership) in FY90 According to Technology Classification

Technology classification [by industry]	Total No. of con- tracts	Appointed technology		Other conditions			
		Total con- tracts	Over ¥100 mil.	Exclu- sive right	License resale right	Cross licens- ing	Stock- own- ship
All industries	3211	1957	858	1188	1017	89	16
Agriculture, forestry and fishing	5			4	5		
Mining	1						
Construction	18	2	1	15	7		
Manufacturing	3169	1946	852	1161	996	89	15
Food and tobacco	32			18	12	2	
Textile	32	3	3	28	21		
Clothing and textile products	159	49	38	130	76		1
Outer garments	106	43	34	88	51		1
Other clothing and textile products	53	6	4	42	25		
Lumber, wood products, furniture, etc.	13	1	1	9	3		
Pulp, paper products, and printing	10			6	2		
Chemical products	207	1	1	105	89	9	7
Inorganic chemistry, etc.	6			2	1		2
Organic chemistry, etc.	38			15	17	5	
Chemical fibers	6			3	3	2	1
Oil, fat processing, soap, etc.	15	1	1	11	5		
Medicine	103			56	47	2	3
Other chemical products	39			18	16		1
Petroleum and coal products	11			1	1	1	
Rubber products	9	1	1	4			
Tanned skin, leather products, and fur	48	48	43	41	20		
Ceramics	36	1	1	10	10	2	
Iron and steel	7			2	1		
Nonferrous metals	19	7	1	3	6	6	
Metal products	44	1	1	22	16	2	1

[Continuation of Table 2-10]

Technology classification [by industry]	Total No. of con- tracts	Appointed technology		Other conditions			
		Total con- tracts	Over ¥100 mil.	Exclu- sive right	License resale right	Cross licens- ing	Stock- owner- ship
General machinery and devices	295	79	44	127	75	9	2
Boilers and motors	64	57	33	5	2	5	
Machinery for agriculture, construction and mining	7			5	3		
Metal processing machinery	32	4		18	6	2	1
Textile machinery	5			4			
Specialized industrial machinery	44	5	4	32	14		
General industrial machinery	115	9	3	55	43		
Pumps, compressors, and fans	8			6	4		
Power machinery	19	1		10	2		
Chemical machinery and devices	74	7	2	33	33		
Other general industrial machinery	14	1	1	6	4		
Other machinery	28	4	4	8	7	2	1
Transportation machinery	80	20	17	25	17		
Precision machinery	66	16	14	35	21	3	2
Electric machinery and devices	1972	1692	661	519	582	54	2
Machinery for power generation, transmission, and electric machinery for industry	20			5	9	2	
Electric appliances, bulbs, and lighting equipment	13			1		3	
Communications machinery	148	17	12	15	26	5	
Wire and wireless communica- tions machinery	53	14	10	9	15	3	
Radio, TV, and audio equipment	95	3	2	8	11	2	
Other communications equipment							
Equipment for electronic applications	1656	1585	572	470	497	15	2
Computers	1588	1561	552	446	477	11	1
Other equipment for electronics applications	68	24	20	24	20	4	1
Electronic and communications parts	122	83	72	24	45	27	

[Continuation of Table 2-10]

Technology classification [by industry]	Total No. of con- tracts	Appointed technology		Other conditions			
		Total con- tracts	Over ¥100 mil.	Exclu- sive right	License resale right	Cross licens- ing	Stock- owner- ship
Other electric machinery	13	7	5	4	5	2	
Other products	129	27	28	76	44	1	
Precious metals, ornaments, etc	15	2	2	14	8		
Recreational equipment	40	7	6	17	8	1	
Plastic products	38			20	15		
Manufacturing industry not classified otherwise	36	18	18	25	15		
Other industries	18	9	3	8	9		1

Table 2-11. Status of Amended Contracts in FY90

Technology classification code	Total No. of contracts	Appointed technology		Contract period				Royalty			
		Total No. of contracts	Payment exceeds ¥100 million	Ex-tended	Short-ened	Others	Total	Initial payment			
								In-creased	Reduced	Others	Total
0 1	1283	612	187	430	3	27	460	262	14	3	279
0 2	1			1			1				
0 3											
0 4	8			4			4				
0 5	1267	609	186	423	3	27	453	261	14	3	278
1 1	39	1		15			15	2		1	3
1 2	42	2	1	15			15				
1 3	128	42	13	76	2	2	80	4			4
1 4	79	33	10	43		1	44	3			3
1 5	49	9	3	33	2	1	36	1			1
1 6	7	1	1	5			5				
1 7	7			2			2				
2 0	116			32		7	39	19	3		22
2 1	7			2			2	1			1
2 2	33			5		2	7	8	2		10
2 3	1			1			1				
2 4	12			6			6				
2 5	26			7		2	9	7	1		8
2 6	37			11		3	14	3			3
3 0	6			1			1	3	1		4
3 1	3	1									
3 2	42	42	8	25			25				
3 3	11			5			5	2			2
3 4	2	1		1			1				
3 5	6	1		4			4				
3 6	25			11		1	12				

[Continuation of Table 2-11]

Technology class- ifica- tion code	Total No. of con- tracts	Appointed technology		Contract period				Royalty			
		Total No. of con- tracts	Payment exceeds ¥100 million	Ex- tended	Short- ened	Others	Total	Initial payment			
								In- creased	Reduced	Others	Total
4 0	139	19	2	61		5	66	21	1		22
4 1	23	12	1	14			14	4			4
4 2	12			3		1	4	2			2
4 3	8			3		1	4	1			1
4 4	3			2			2				
4 5	15			3			3	2			2
4 6	60	8	1	31		2	33	9	1		10
4 7	6			5			5				
4 8	11			6		1	7	2			2
4 9	34	3		16		1	17	6	1		7
5 0	9	3	1	4			4	1			1
5 1	18	1		5		1	6	3			3
5 2	79	44	7	39		2	41	12		1	13
5 3	27	11		13			13	2			2
6 0	531	422	144	99	1	9	109	187	8	1	196
6 1	14	4	1	8			8	2			2
6 2	2										
6 3	98	24	6	25		2	27	10			10
6 4	31	23	5	9		2	11	8			8
6 5	67	1	1	16			16	2			2
6 6											
6 7	371	358	129	54	1	7	62	162	8	1	171
6 8	363	354	128	53	1	7	61	158	8	1	167
6 9	8	4	1	1			1	4			4
7 0	38	30	8	8			8	11			11
7 1	8	6		4			4	2			2
8 0	57	22	10	19		1	20	9	1		10
8 1	5	4	2	2			2				
8 2	19	7	3	4			4	1			1
8 3	18	2	1	5		1	6	5	1		6
8 4	15	9	4	8			8	3			3
9 0	7	3	1	2			2	1			1



[Continuation of Table 2-11]

Technology classi- fication code	Total No. of con- tracts	Royalty								
		Running royalty				Minimum payment				
		In- creased	Reduced	Others	Total	In- creased	Reduced	Others	Total	
0 1	1283	306	120	80	506	168	47	3	218	293
0 2	1									
0 3										
0 4	8	4			4					3
0 5	1267	299	120	79	498	168	47	3	218	289
1 1	39	17	5	3	25	3	3	1	7	1
1 2	42	3	4	4	11	8			8	24
1 3	128	27	13	8	48	72	8	1	81	17
1 4	79	16	11	5	32	35	6	1	42	13
1 5	49	11	2	3	16	37	2		39	4
1 6	7	2			2					1
1 7	7		1		1		1		1	4
2 0	116	20	9	8	37	7	1		8	44
2 1	7	1	1		2					3
2 2	33	8	3	4	15	1			1	12
2 3	1			1	1	1			1	
2 4	12	1	1		2	1			1	7
2 5	26	3	2	2	7	3	1		4	4
2 6	37	7	2	1	10	1			1	18
3 0	6	1			1					
3 1	3	1	1		2		1		1	1
3 2	42	4	1	4	9	20	1		21	8
3 3	11	3	3		6	1	2		3	2
3 4	2	1			1					
3 5	6	2	1	1	4		1		1	1
3 6	25	3	5	2	10	1	4		5	10

[Continuation of Table 2-11]

Technology classification code	Total No. of contracts	Royalty								
		Running royalty				Minimum payment				
		In-creased	Reduced	Others	Total	In-creased	Reduced	Others	Total	
4 0	139	19	20	9	48	8	7		15	37
4 1	23	2	1	3	6					4
4 2	12	2	2	1	5	1			1	7
4 3	8	4	1		5	2			2	2
4 4	3		1		1					
4 5	15	3	1		4	1			1	7
4 6	60	6	11	3	20	3	6		9	11
4 7	6		2		2		1		1	
4 8	11	1	1	1	3		1		1	2
4 9	34	5	7		12	3	4		7	7
5 0	9		1	2	3					2
5 1	18	2	3	2	7	1	1		2	6
5 2	79	14	9	4	27	1	5		6	17
5 3	27	2		2	4	4	1		5	9
6 0	531	174	43	31	248	29	10	1	40	99
6 1	14	3	1	1	5	2	2		4	6
6 2	2	1			1		1		1	
6 3	98	16	6	9	31	1		1	2	49
6 4	31	6	5	3	14	1			1	8
6 5	67	10	1	6	17			1	1	41
6 6										
6 7	371	151	29	20	200	26	7		33	32
6 8	363	151	28	19	198	28	7		33	31
6 9	8		1	1	2					1
7 0	38	2	4	1	7					11
7 1	8	1	3		4					1
8 0	57	8	5	3	14	14	2		16	14
8 1	5	3		1	4	4			4	1
8 2	19	1	2	2	5	2	1		3	6
8 3	18	1	2		3	1	1		2	6
8 4	15	1	1		2	7			7	1
9 0	7	3		1	4					1

[Continuation of Table 2-11]

Technology classi- fica- tion	Total No. of contracts	Exclusive right				License resale right			
		Ob- tained	Re- voked	Others	Total	Ob- tained	Re- voked	Others	Total
0 1	1283	8	11		19	30	8		38
0 2	1								
0 3									
0 4	8		1		1				
0 5	1267	8	10		18	30	8		38
1 1	39		1		1				
1 2	42								
1 3	128					1	1		2
1 4	79					1			1
1 5	49						1		1
1 6	7								
1 7	7					1			1
2 0	116					3			3
2 1	7					1			1
2 2	33								
2 3	1					1			1
2 4	12								
2 5	26					1			1
2 6	37								
3 0	6								
3 1	3								
3 2	42						1		1
3 3	11								
3 4	2								
3 5	6								
3 6	25		2		2	1			1

[Continuation of Table 2-11]

Technology classification	Total No. of contracts	Exclusive right				License resale right			
		Ob-tained	Re-voked	Others	Total	Ob-tained	Re-voked	Others	Total
4 0	139	2	3		5	3	1		4
4 1	23								
4 2	12		1		1				
4 3	8						1		1
4 4	3								
4 5	15								
4 6	60		2		2	3			3
4 7	6					1			1
4 8	11					1			1
4 9	34		1		1	1			1
5 0	9		1		1				
5 1	18	2			2				
5 2	79					2			2
5 3	27								
6 0	531	6	4		10	17	5		22
6 1	14		3		3		2		2
6 2	2								
6 3	98								
6 4	31								
6 5	67								
6 6									
6 7	371	5	1		6	17	3		20
6 8	363	5	1		6	17	3		20
6 9	8								
7 0	38	1			1				
7 1	8								
8 0	57					2			2
8 1	5								
8 2	19								
8 3	18					2			2
8 4	15								
9 0	7								

[Continuation of Table 2-11]

Technology classification code	Total No. of contracts	Regions in which resale is permitted				Technology scope				Others
		Gained	Reduced	Others	Total	Gained	Reduced	Others	Total	
0 1	1283	43	20	6	69	324	6	27	357	104
0 2	1									
0 3										
0 4	8									
0 5	1267	43	20	6	69	322	6	27	355	103
1 1	39	1		1	2	4		1	5	
1 2	42					6			6	2
1 3	128	7	3		10	24	4		28	9
1 4	79	6	2		8	14	3		17	7
1 5	49	1	1		2	10	1		11	2
1 6	7					1			1	1
1 7	7									
2 0	116	12	1		13	20		8	28	7
2 1	7	1			1	1			1	
2 2	33	4	1		5	3		3	6	2
2 3	1	1			1			1	1	
2 4	12					2		1	3	
2 5	26	5			5	8		3	11	4
2 6	37	1			1	6			6	1
3 0	6									4
3 1	3									1
3 2	42	1	1		2	7		3	10	3
3 3	11	1			1					2
3 4	2									
3 5	6		1		1	1		1	2	
3 6	25	1			1	4		1	5	2

[Continuation of Table 2-11]

Technology classification code	Total No. of contracts	Regions in which resale is permitted				Technology scope				Others
		Gained	Re-duced	Others	Total	Gained	Re-duced	Others	Total	
4 0	139	9	5	1	15	20	1	6	27	12
4 1	23		1		1	4			4	3
4 2	12		2		2	1		1	2	
4 3	8	3			3					
4 4	3									
4 5	15					4			4	2
4 6	60	5	2		7	9	1	4	14	7
4 7	6	1			1	2		1	3	1
4 8	11	1	1		2	1		1	2	1
4 9	34	2	1		3	4	1	1	6	4
5 0	9	1			1	2		1	3	1
5 1	18	1		1	2	2		1	3	
5 2	79	2	3	1	6	12	1	2	15	12
5 3	27	1			1	3			3	4
6 0	531	7	3	3	13	206		2	208	43
6 1	14	1	1	1	3	5			5	
6 2	2					1			1	
6 3	98		1		1	34		2	36	3
6 4	31		1		1	6		2	8	1
6 5	67					28			28	2
6 6										
6 7	371	4	1	2	7	154			154	35
6 8	363	4	1	2	7	153			153	35
6 9	8					1			1	
7 0	38	2			2	12			12	4
7 1	8									1
8 0	57	1	3		4	14		3	17	1
8 1	5					4			4	
8 2	19	1			1	5			5	1
8 3	18		2		2	1		3	4	
8 4	15		1		1	4			4	
9 0	7					2			2	1

Table 2-12[A]. Number of Contracts According to Royalty. Number of contracts in FY90 that require initial payments according to amount of royalty. (The numbers in the top row are running royalties in percent. The column marked "90" lists the number of contracts with royalty payments other than in percent.)

Technology classification (by industry)		01	02	03	04	05	06	07	08	10	12
02	Agriculture, forestry, and fishing		1		1	1					
03	Mining										
04	Construction		2	1							
11	Food and tobacco					3					
12	Textile	1					1				
14	Outer garments	1				2	1	2		1	
15	Other clothing and textile products				1						
16	Lumber, wood products, furniture, etc.	3	1			1			1		
17	Pulp, paper products, and printing		1								
21	Inorganic chemistry, etc.	2				1	2				
22	Organic chemistry, etc.		1								
23	Chemical fibers		1					1			
24	Oil and fat processing, soap, etc.		1	1		1					
25	Medicine	4	4	5	5	6	4	3	3		2
26	Other chemical products	2	2	2	3	2	1	1			
30	Petroleum and coal products					2					
31	Rubber products						1				
32	Tanned skin, leather products, and fur				1						
33	Ceramics	2				2					
34	Iron and steel	2									
35	Nonferrous metals				1						
36	Metal products	1	3	2	5	4	1			1	
41	Boilers and motors		1		1						
42	Machinery for agriculture, construction, and mining										1
43	Metal processing machinery		2		2	4		1			
44	Textile machinery		1		2	1					
45	Specialized industrial machinery	1		3	3	1	2	1	1		1
48	Power machinery			2	2	1					
49	Chemical machinery and devices	1	2	2	4	5		1		1	
50	Other general industrial machinery		1	2							
51	Other machinery	1	1	1	2			2			
52	Transportation machinery	1	3	9	4	3	1	1	2	2	
53	Precision machinery	2	1	1	1	3	2			1	
61	Machinery for power generation, transmission, and electric machinery for industry	2	1		1	2					
62	Electric appliances, bulbs, and lighting equipment		1	1							
64	Wire and wireless communications machinery			1							
65	Radio, television, and audio equipment	1	2								
68	Computers	2	4	7	5	3	1			4	2
69	Other equipment for electronic applications	4	1	4	4	2		1	1		
70	Electronic and communications parts	18	8	4	5	3	2	1			
71	Other electric machinery		4								
81	Precious metals, ornaments, etc.	1			1		2				
82	Recreational equipment						1	1			
83	Plastic products	2	1	5	2	1		1	1		
84	Manufacturing industry not classified otherwise					3	1	5	2		
90	Other industries	1	1	3				2			
Total		55	52	58	54	58	24	24	11	10	6

[Continuation of Table 2-12[A]]

Technology classification (by industry)		13	15	20	24	29	30	32	35	38	50	90	Total
02	Agriculture, forestry, and fishing												3
03	Mining											1	1
04	Construction											4	7
11	Food and tobacco											2	5
12	Textile												2
14	Outer garments											1	8
15	Other clothing and textile products												1
16	Lumber, wood products, furniture, etc.												8
17	Pulp, paper products, and printing												1
21	Inorganic chemistry, etc.											1	1
22	Organic chemistry, etc.											12	18
23	Chemical fibers											1	2
24	Oil and fat processing, soap, etc.												4
25	Medicine			1							1	7	45
26	Other chemical products											1	14
30	Petroleum and coal products											5	5
31	Rubber products												2
32	Tanned skin, leather products, and fur												2
33	Ceramics											8	12
34	Iron and steel											1	3
35	Nonferrous metals											4	5
36	Metal products											3	20
41	Boilers and motors											3	5
42	Machinery for agriculture, construction, and mining											1	2
43	Metal processing machinery											1	10
44	Textile machinery												4
45	Specialized industrial machinery			1								6	20
48	Power machinery											3	8
49	Chemical machinery and devices			1								9	26
50	Other general industrial machinery											8	9
51	Other machinery											7	14
52	Transportation machinery											9	35
53	Precision machinery											7	18
81	Machinery for power generation, transmission, and electric machinery for industry											4	10
62	Electric appliances, bulbs, and lighting equipment											2	4
64	Wire and wireless communications machinery										1	11	13
65	Radio, television, and audio equipment											41	44
68	Computers	1	2	1		1	1	1	3	1	3	289	331
69	Other equipment for electronic applications											18	35
70	Electronic and communications parts											16	57
71	Other electric machinery												4
81	Precious metals, ornaments, etc.												4
82	Recreational equipment				1							1	4
83	Plastic products												13
84	Manufacturing industry not classified otherwise											2	13
90	Other industries											2	9
Total		1	4	2	1	1	1	1	3	1	5	489	859



Table 2-12[B]. Number of Contracts According to Royalty. Number of contracts in FY90 that require no initial payments according to amount of royalty. (The numbers in the top row are running royalties in percent. The column marked "90" lists the number of contracts with royalty payments other than in percent.)

Technology classification	01	02	03	04	05	06	07	08	09	10	11	12	13
02 Agricultural, forestry, and fishing													
04 Construction		1		1									
11 Food and tobacco	1	4	5	2	1								
12 Textile		2	1	5	7	5	3			1			
14 Outer garments	4	8	8	6	15	7	7	6		4			
15 Other clothing and textile products	4	1	3	7	8	9	3	6		3			
16 Lumber, wood products, furniture, etc.		2				2							
17 Pulp, paper products, and printing		1	1		1			1		1			
21 Inorganic chemistry, etc.										1			
22 Organic chemistry, etc.		1											
23 Chemical fibers			1										
24 Oil and fat processing, soap, etc.	1	2	1	1	1					1			
25 Medicine	3	1	1	3	8	2		1		1			1
26 Other chemical products		3		1	2	1				1			
30 Petroleum and coal products													
31 Rubber products		1		1	1		1						
32 Tanned skin, leather products, and fur	1			9	8	6	4	6		3			
33 Ceramics	3	1						1	1	1			
34 Iron and steel													
35 Nonferrous metals				1									
36 Metal products	1		4	2		1	1			1			
41 Boilers and motors						1							
42 Machinery for agriculture, construction, and mining					1				1				
43 Metal processing machinery	1	4			1		1		1				
45 Specialized industrial machinery	1		2		1								
47 Pumps, compressors, and fans		2	1		3								
48 Power machinery	1		1	1									
49 Chemical machinery and devices			1	2	2			2					
50 Other general industrial machinery				1									
51 Other machinery			1	1		1						1	
52 Transportation machinery	1		1	2	2	1	1	2					
53 Precision machinery		1	1	3	7	4	2	1	2	3			
61 Machinery for power generation, transmission, and electric machinery for industry	2									1			
62 Electric appliances, bulbs, and lighting equipment	1		1										
64 Wire and wireless communications machinery		2											
65 Radio, television, and audio equipment		1											
68 Computers	3	2	1	1	1		1		1	4	1	2	
69 Other equipment for electronic applications	2	1											
70 Electronic and communications parts		2	1	1	2					1			
71 Other electric machinery		2			1								
81 Precious metals, ornaments, etc.			1		1	4				3			
82 Recreational equipment		1	2	3	3	1	3	4		4			
83 Plastic products	2	2	3		1	1							
84 Manufacturing industry not classified otherwise	1			1	3	2	4	2		1			

[Continuation of Table 2-12[B]]

Technology classification	14	15	20	25	30	33	35	38	40	45	49	50	90
02 Agricultural, forestry, and fishing													2
04 Construction										1			3
11 Food and tobacco						1							2
12 Textile	1												3
14 Outer garments			1										8
15 Other clothing and textile products													3
18 Lumber, wood products, furniture, etc.													3
17 Pulp, paper products, and printing													2
21 Inorganic chemistry, etc.													1
22 Organic chemistry, etc.													3
23 Chemical fibers													
24 Oil and fat processing, soap, etc.													
25 Medicine													4
28 Other chemical products													3
30 Petroleum and coal products													2
31 Rubber products													
32 Tanned skin, leather products, and fur													5
33 Ceramics						1							4
34 Iron and steel													2
35 Nonferrous metals													1
38 Metal products													1
41 Boilers and motors													1
42 Machinery for agriculture, construction, and mining													1
43 Metal processing machinery													2
45 Specialized industrial machinery													11
47 Pumps, compressors, and fans													
48 Power machinery													1
49 Chemical machinery and devices													7
50 Other general industrial machinery													
51 Other machinery													
52 Transportation machinery													4
53 Precision machinery													4
61 Machinery for power generation, transmission, and electric machinery for industry													1
62 Electric appliances, bulbs, and lighting equipment													
64 Wire and wireless communications machinery													6
65 Radio, television, and audio equipment													14
68 Computers		2	1	1	3	1	1	1	4	3	1	10	245
69 Other equipment for electronic applications													6
70 Electronic and communications parts			1										7
71 Other electric machinery													1
81 Precious metals, ornaments, etc.													
82 Recreational equipment													3
83 Plastic products													
84 Manufacturing industry not classified otherwise												1	1

Table 2-12[C]. Number of Contracts According to Royalty. Number of contracts in FY90 that require minimum and initial payments according to the amount of royalty. (The numbers in the top row are running royalties in percent. The column marked "90" lists the number of contracts with royalty payments other than in percent.)

Technology classification	01	02	03	04	05	06	07	08	10	12	90	Total
02 Agricultural, forestry, and fishery					1							1
03 Mining											1	1
04 Construction											1	1
12 Textile						1						1
14 Outer garments					2		1		1		1	5
15 Other clothing and textile products				1								1
16 Lumber, wood products, furniture, etc.	1				1							2
17 Pulp, paper products, and printing		1										1
22 Organic chemistry, etc.						1					1	2
24 Oil and fat processing, soap, etc.		1	1		1							3
25 Medicine	1		2		2	1		3			2	14
28 Other chemical products				1			1					2
31 Rubber products					1							1
32 Tanned skin, leather products, and fur				1								1
33 Ceramics					1						2	3
35 Nonferrous metals				1								1
36 Metal products		2	1	2		1					2	8
42 Machinery for agriculture, construction, and mining										1		1
43 Metal processing machinery					1						1	2
44 Textile machinery				1	1							2
45 Specialized industrial machinery			1		1	1		1				4
48 Power machinery					1							1
49 Chemical machinery and devices	1				2		1				1	5
51 Other machinery		1	1	1							2	6
52 Transportation machinery		1	1		1						1	4
53 Precision machinery				1	2				1			4
61 Machinery for power generation, transmission, and electric machinery for industry				1	1						1	3
62 Electric appliances, bulbs, and lighting equipment			1								1	1
64 Wire and wireless communications machinery											3	3
65 Radio, television, and audio equipment											23	25
68 Computers	1		1									1
69 Other equipment for electronic applications		1									1	3
70 Electronic and communications parts					1	1					1	2
81 Precious metals, ornaments, etc.						2						2
83 Plastic products		1	2	1								4
84 Manufacturing industry not classified otherwise					1							1
90 Other industry			1								1	2
Total	4	8	12	13	21	8	4	4	2	1	45	122

Table 2-12[D]. Number of Contracts According to Royalty. Number of contracts in FY90 that require minimum payments but no initial payments according to the amount of royalty. (The numbers in the top row are running royalties in percent. The column marked "90" lists the number of contracts with royalty payments other than in percent.)

Technology classification	01	02	03	04	05	06	07	08	09	10	11	14	20	36	45	50	90	Total
04 Construction				1														1
11 Food and tobacco	1	3	4															8
12 Textile		1		5	7	4	3			1		1					2	24
14 Outer garments	3	5	6	4	8	7	7	6		2			1				1	50
15 Other clothing and textile products	4	1	3	7	7	9	3	6		3								43
16 Lumber, wood products, furniture, etc.		2															1	3
24 Oil and fat processing, soap, etc.				1	1					1								3
25 Medicine						2												2
26 Other chemical products		1			1												1	3
31 Rubber products				1														1
32 Tanned skin, leather products, and fur	1			8	7	5	4	6		3								34
33 Ceramics		1						1	1								1	4
36 Metal products	1			1													1	3
42 Machinery for agriculture, construction, and mining					1													1
45 Specialized industrial machinery																	2	2
49 Chemical machinery and devices				1	1												1	3
50 Other general industrial machinery				1														1
52 Transportation machinery			1	1													1	3
53 Precision machinery			1	2	5	3	2	1	2	3							2	21
68 Computers	1				1					1	1		1	1	2	1	18	27
69 Other equipment for electronic applications	1																	1
81 Precious metals, ornaments, etc.					1	4				3								8
82 Recreational equipment			1	1	1	1	2	4		3								13
83 Plastic products						1												1
84 Manufacturing industry not classified otherwise				1	3	2	4	2		1							1	14
Total	12	14	16	35	44	38	25	28	3	21	1	1	2	1	2	1	32	274

- END -

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